Environment Canada | Environnement Canada
Canadian Forestry Service | Service canadien des forêts

Metric Timber Tables For The Commercial Tree Species Of Central And Eastern Canada

T.G. Honer, M.F. Ker, and I.S. Alemdag
Maritimes Forest Research Centre

M-X-140

Environment Canada | Environnement Canada

0016033H DEST PVM EXCH COPY 03
SD 391 C36
VOL ISS 140
MARITIMES FOREST RESEARCH CENTRE. I
NFORMATION REPORT M-X

MARITIMES FOREST RESEARCH CENTRE

The Maritimes Forest Research Centre (MFRC) is one of six regional establishments of the Canadian Forestry Service, within Environment Canada. The Centre conducts a program of work directed toward the solution of major forestry problems and the development of more effective forest management techniques for use in the Maritime Provinces.

The program consists of two major elements - research and development, and technical and information services. Most research and development work is undertaken in direct response to the needs of forest management agencies, with the aim of improving the protection, growth, and value of the region's forest resource for a variety of consumptive and non-consumptive uses; studies are often carried out jointly with provincial governments and industry. The Centre's technical and information services are designed to bring research results to the attention of potential users, to demonstrate new and improved forest management techniques, to assist management agencies in solving day-to-day problems, and to keep the public fully informed on the work of the Maritimes Forest Research Centre.

METRIC TIMBER TABLES FOR THE COMMERCIAL TREE SPECIES OF CENTRAL AND EASTERN CANADA

by

T.G. HONER, M.F. KER, and I.S. ALEMDAG

Maritimes Forest Research Centre

Fredericton, New Brunswick

Information Report M-X-140

Canadian Forestry Service

Environment Canada

1983

© Minister of Supply and Services, Canada 1983
Catalogue no. Fo46-19/140E
ISBN 0-662-12577-0
ISSN 0704-769X

Copies of this report may be
obtained from

Maritimes Forest Research Centre
Canadian Forestry Service
P.O. Box 4000
Fredericton, N.B. Canada E3B 5P7

Honer,[1] T.G., M.F. Ker,[2] and I.S. Alemdag.[3] 1983. Metric timber tables for the commercial tree species of central and eastern Canada. Can. For. Serv., Marit. For. Res. Cent. Inf. Rep. M-X-140.

ABSTRACT

Metric timber tables are provided for 21 major commercial species of central and eastern Canada, based on a mathematical conversion of existing volume and diameter equations. Four types of tables are included 1) total volume, 2) merchantable volume (stump height of 0.15 m and top diameter inside bark of 7.0 cm), 3) ratios of merchantable volume to total volume for various stump heights, top diameters, and merchantable lengths, 4) diameters inside and outside bark for stump height, breast height and sections of the lower bole.

RESUME

On fournit les tarifs de cubage fondés sur la conversion mathématique d'équations existantes du volume et du diamètre pour 21 essences marchandes importantes du centre et de l'est du Canada. Ces tables sont de quatre types: 1) volume total, 2) volume marchand (hauteur de la sourche de 0,15 m et diamètre au fin bout sans l'écorce de 7,0 cm), 3) rapport volume marchand/volume total pour divers diamètres au fin bout, hauteurs de la sourche et longueurs marchandes, 4) diamètre avec et sans l'écorce en fonction de la hauteur de la souche, à hauteur d'homme et pour des sections du bas du fût.

[1]Senior Mensurationist, Pacific Forest Research Centre, Victoria, B.C.
[2]Forestry Officer, Maritimes Forest Research Centre, Fredericton, N.B.
[3]Research Scientist, Petawawa National Forestry Institute, Chalk River, Ont.

CONTENTS

	Page
INTRODUCTION	1
TOTAL STEM VOLUME EQUATION	2
MERCHANTABLE STEM VOLUME CONVERSION FACTORS	2
Method 1: Height Ratio	2
Method 2: Squared Diameter Ratio	3
Method 3: Adjusted Squared Diameter Ratio	4
Method 4: Diameter-Height Ratio	4
DERIVATION OF METRIC VOLUME EQUATIONS	5
Measurement Units and Notation	5
Conversion Factors	5
Diameter Conversion	5
Total Volume Equation	6
Merchantable Volume Equations	6
Height ratio method	6
Squared diameter ratio method	7
Adjusted squared diameter ratio method	7
Diameter - height ratio method	8
METRIC VOLUME TABLES AND CONVERSION FACTORS	8
Total Cubic Metre Volume Tables	8
Merchantable Cubic Metre Volume Tables	8
Merchantable Cubic Metre Conversion Factors	8
Accuracy	9
Taper Coefficients	9
Total Cubic Volume Tables	9
Merchantable Volume Tables and Conversion Factors	9
Application	10
Total stem volume: Equation 14	10
Sawlog volume: Equation 18	10
Merchantable stem volume: Equation 22	11
Volume summary	11

BREAST HEIGHT AND STUMP DIAMETER EQUATIONS		11
Model Development		11
Metric Diameter Equations		12
ACKNOWLEDGMENT		12
REFERENCES		13
LIST OF TABLES		14
APPENDIX I	Total Cubic Metre Volume Tables	23
APPENDIX II	Merchantable Cubic Metre Volume Tables	45
APPENDIX III	Ratios of Merchantable Volume to Total Volume	67
APPENDIX IV	Stump Diameter Outside Bark Using Diameter Breast Height Outside Bark	83
APPENDIX V	Diameter Breast Height Outside Bark Using Stump Diameter Outside Bark	97
APPENDIX VI	Stump Diameter Inside Bark Using Diameter Breast Height Outside Bark	111
APPENDIX VII	Diameter Breast Height Outside Bark Using Stump Diameter Inside Bark	125
APPENDIX VIII	Useful Conversion Factors	139

INTRODUCTION

In estimating the volume of forest trees and stands there is a need for species reference tables that show total and merchantable volume for various utilization limits. In addition, supplementary tables are required for estimating stump diameters and breast height diameters, both inside and outside bark, from measurements of radial growth and/or age. Such reference tables facilitate arithmetic calculations and the determination of quantitative estimates in both field and office and are necessary tools in the performance of forestry work.

For many years the Canadian Forestry Service has prepared numerous tables to fill this requirement. The Form-Class Volume Tables originally published in 1930 (Anon. 1930, 1948) were developed and used in Canada for estimating total and merchantable tree volumes. These tables used the ratio of diameter inside bark at one-half the height above breast height to diameter at breast height, inside bark, as an index of tree form and required, for their proper application, the use of local diameter/form-class curves. They were difficult to apply to a given stand because of the time and effort required to measure upper stem diameters, develop local diameter/form-class curves for each stand, and interpolate volumes between tabulated form classes.

To alleviate some of these problems, a set of standard total and merchantable tree volume equations was developed, which ignored form as an independent variable, was easier to apply, and could be easily incorporated in computer-based inventory systems (Honer 1967). They were based on the same data as the original Form-Class Volume Tables, with some additional measurements from various research and management studies.[1] These data also provided the basis for the equations that established the relationships between stump height, breast height, and the associated diameters of the lower stem (Alemdag and Honer 1973), that are often used in reconstructing the volumes of stands following harvesting. Since the publication of these tables, the Canadian government has officially adopted the metric (SI) system of measurement, and through establishment of a Metric Commission, has coordinated and promoted the adoption of the metric system throughout the nation. Various aspects of metric conversion in forestry are discussed by Smith (1975), and Bruce (1979).

This report describes the development of the volume and diameter equations and their conversion to the metric system. It provides metric volume equations, diameter equations, and tables for 21 major commercial tree species of central and eastern Canada, based on a mathematical conversion of Honer's (1967) volume equations and those of Alemdag and Honer (1973, 1977) for estimating diameters at stump height, the lower bole, and at breast height. Numerous sets of tables are included in this report: 1) total cubic volume; 2) merchantable cubic volume to a stump height of 0.15 m and a top diameter inside bark of 7.0 cm; 3) ratios of merchantable to total volume for various stump heights, top diameters and merchantable lengths; 4) diameters inside and outside bark at stump height and breast height; and 5) useful conversion factors.

[1] These and other tree data were transferred to magnetic tape between 1964 and 1971 and are available on loan for research purposes from the Petawawa National Forestry Institute, Chalk River, Ont. (MacLeod 1978)

TOTAL STEM VOLUME EQUATION

The purpose of any total cubic volume equation is to express the volume-diameter-height relationship so that stem volume may be estimated from field measures of diameter and height. The expression must provide accurate estimates for all size classes, and the error associated with the estimates should be independent of tree size.

The total volume equation was derived as follows: since DBH is measured at a constant height (h) above ground level, this height represents a varying percentage of the total tree height, a large percentage for small trees and a small percentage for large trees. In the same manner, the volume to breast height on relatively small trees represents a large proportion of the total tree volume, while on large trees it represents a very small proportion. Therefore the ratio of the volume below breast height to total tree volume is related to the ratio of breast height to total tree height.

For example, the variables were expressed as D^2h/V and h/H and the relationship was later simplified and written as

$$D^2/V = a + b/H$$

and cubic volume is estimated from the equation

$$V = D^2/(a + b/H)$$

where D is diameter at breast height outside bark, H is total tree height, V is total cubic volume inside bark and a, b are regression coefficients. An evaluation of this and other functions has been presented (Honer 1965b).

MERCHANTABLE STEM VOLUME CONVERSION FACTORS

Foresters have long been faced with the problem of obtaining merchantable volumes for a variety of utilization levels involving different specifications for stump height, top diameter, or merchantable length. In past years, tables showing the percent of merchantable tree volume for logs of given length, as well as taper tables have been used to determine merchantable volume. However, merchantable cubic conversion factors can be computed from equations which describe the distribution of volume over the tree stem. These factors, when applied to the total cubic volume, provide an estimate of merchantable volume for the specified level of utilization (Honer 1964, 1965a). The four methods used to compute the merchantable conversion factors are described below.

Method 1: Height Ratio

A method to determine merchantable volume based on the height to the merchantable limit and an estimate of total volume was investigated. The height to the merchantable limit was represented by values of X_1 and volume by values of Y_1 where

X_1 = height to merchantable limit/total tree height

Y_1 = volume to merchantable limit/total tree volume.

The relationship between the volume and height ratios was established

$$Y_1 = a + bX_1 + cX_1^2$$

The equation can be modified to account for a stump volume deduction as follows:

Let X_1 represent the ratio of merchantable height to total height (Hm_1) and X_{12} represent the ratio of stump height to total height (Hm_2).

(I) volume ratio to $Hm_1 = Y_1 = a + bX_1 + cX_1^2$

(II) volume ratio to $Hm_2 = Y_{12} = a + bX_{12} + cX_{12}^2$

(I-II) proportion of remaining volume equals

$$(Y_1 - Y_{12}) = b(X_1 - X_{12}) + c(X_1^2 - X_{12}^2)$$

therefore $Y_1 - Y_{12} = b(X_1 - X_{12}) + c(X_1^2 - X_{12}^2)$

This method permits one to derive merchantable volume conversion factors for any portion of the tree stem defined by two measures of merchantable height.

Method 2: Squared Diameter Ratio

Volume estimates are often required for specified top diameters and stump heights and in deriving a method to permit the determination of merchantable volume the following approach was used.

If a relationship between the ratios of squared diameters (X_2) and the ratios of volume to those diameters (Y_1) are known, then it would be possible to determine from a total volume estimate, the merchantable volume to a specified top diameter. The relationship could then be adjusted to account for the volume attributed to the stump section.

Let X_2 represent the ratio of squared diameters and Y_1 represent the ratios of volume to that merchantable diameter limit where:

X_2 = merchantable top $Dib^2/DBHob^2$

Y_1 = volume to merchantable limit/total tree volume

The relationship between the volume and squared diameter ratios was developed, but values representing the tree top, breast height, and sections below breast height were not included in the regression.

$$Y_1 = a + bX_2 + cX_2^2$$

Method 3: Adjusted Squared Diameter Ratio

To permit the deduction of stump volume it was necessary to adjust the basic data to reflect varying stump heights. The adjustment was accomplished as follows:

(i) The stump volume ratio (stump volume/total volume) of each tree was subtracted from each section volume ratio. Adjusted volume ratios were designated as Y_2.

therefore $Y_2 = Y_1 -$ (stump volume/total volume).

(ii) The squared diameter ratio of each section was increased by a factor representing the height of the tree above stump height. Adjusted ratios were designated as X_3.

therefore $X_3 = X_2$ (total height + stump height)/total height

and the following equation was subsequently developed

$$Y_2 = a + bX_3 + cX_3^2$$

The adjustment described above is a modification of a procedure reported earlier (Honer 1964), and the method permits one to derive merchantable volume conversion factors for specified top diameters and stump heights.

Method 4: Diameter - Height Ratio

The fourth method combines the two concepts and utilizes variables which include the top diameter and the height to that diameter in estimating the proportion of the total tree volume below the merchantable limit.

Let X_4 represent the ratio of diameters, X_5 the proportion of merchantable length and Y_1 represent the ratio of volume to that merchantable limit where:

X_4 = merchantable top Dib/DBHob

$X_5 = (1 - (h_1/H))^2$

Y_1 = volume to merchantable limit/total tree volume

h_1 = height to merchantable top diameter

H = total tree height

The relationship was expressed as

$$Y_1 = a + bX_4 + cX_5$$

and permits the derivation of merchantable volume conversion factors from measures or estimates of top diameter and length of the merchantable bole.

DERIVATION OF METRIC VOLUME EQUATIONS

Measurement Units and Notation

The variables, symbols, and measurement units used in deriving the metric volume equations are summarized in Table 1.

Conversion Factors

The conversion factors for the measurement units in Table 1 are

1 cm = 0.393 701 inch
1 m = 3.280 84 feet
1 m^3 = 35.3147 ft^3

The variables of Table 1 are related by these conversion factors:

$$D_e = 0.393\ 701\ D_m \quad (1)$$

$$d_e = 0.393\ 701\ d_m \quad (2)$$

$$H_e = 3.280\ 84\ H_m \quad (3)$$

$$h_e = 3.280\ 84\ h_m \quad (4)$$

$$S_e = 3.280\ 84\ S_m \quad (5)$$

$$DS_e = 0.393\ 701\ DS_m \quad (6)$$

$$t_e = 0.393\ 701\ t_m \quad (7)$$

$$V_e = 35.3147\ V_m \quad (8)$$

$$VM_e = 35.3147\ VM_m \quad (9)$$

Diameter Conversion

Since tree diameter in the metric system is measured at 1.30 m rather than 4.5 ft, we need an estimate of the ratio of these two diameters before development of the conversion process can proceed. A taper model developed for estimating diameter at breast height outside bark (DBHob) from stump diameter (Alemdag and Honer 1973, 1977) was used to relate d_m and D_e.

The original taper model was

$$D_e = DS_e + b_2 DS_e \ln((S_e + 1)/5.5) \quad (10)$$

where b_2 is a regression coefficient and ln is the natural logarithm.

Substituting Eq. (6) and (5) in (10) gives

$$D_e = 0.393\ 701\ DS_m\ (1 + b_2\ \ln\ ((3.280\ 84\ S_m + 1)/5.5)) \quad (11)$$

If $S_m = 1.30$ m, then $DS_m = d_m$ and

$$D_e = 0.393\ 701\ d_m\ (1-0.043\ 65\ b_2) \quad (12)$$

which is the desired relationship between D_e and d_m.

The eleven taper coefficients (b_2) published by Alemdag and Honer (1973) are given in Table 2, along with the weighted average coefficients for softwoods, hardwoods, and all species combined.

Total Volume Equation

The total volume equation is

$$V_e = D_e^2/(c_1 + (c_2/H_e)) \quad (13)$$

where c_1 and c_2 are regression coefficients (Table 3). To obtain a metric equivalent of this equation we substitute the diameter relationship (Eq. 12) and the appropriate conversion factors (3) and (8) in Eq. 13 (Demaershalk 1972):

$$V_m = 0.004\ 389\ 1\ d_m^2\ (1-0.043\ 65\ b_2)^2/(c_1 + (0.3048c_2/H_m)) \quad (14)$$

Merchantable Volume Equations

The four methods used to compute the merchantable volume are related to their metric counterparts as follows:

1) Height ratio method:

This method defines merchantable volume in terms of height to the merchantable limit:

$$VM_e = V_e\ (p_1 + p_2X_1 + p_3X_1^2) \quad (15)$$

where p_1, p_2, and p_3 are regression coefficients, and $X_1 = h_e/H_e$
The metric version of this equation is

$$VM_m = V_m\ (p_1 + p_2\ (h_m/H_m) + p_3\ (h_m/H_m)^2) \quad (16)$$

This method can also be used to develop a merchantable volume equation using stump height and height to merchantable limit as independent variables:

$$VM_e = V_e(p_2\ ((h_e/H_e) - (S_e/H_e)) + p_3\ ((h_e/H_e)^2 - (S_e/H_e)^2)) \quad (17)$$

The metric version of this equation has identical form since the conversion factors cancel out:

$$VM_m = V_m \, (p_2 \, ((h_m/H_m) - (S_m/H_m)) + p_3 \, ((h_m/H_m)^2 - (S_m/H_m)^2)) \quad (18)$$

The coefficients p_1, p_2, and p_3 for this method are listed in Table 4.

2) Squared diameter ratio method:

This equation gives merchantable volume in terms of top diameter inside bark and DBH:

$$VM_e = V_e \, (q_1 + q_2 \, X_2 + q_3 \, X_2^2) \quad (19)$$

where q_1, q_2, and q_3 are regression coefficients, and $X_2 = (t_e/D_e)^2$.

The metric version of this equation is obtained by substituting (7), (8), (9), and (12) in (19):

$$VM_m = V_m \, (q_1 + q_2 X_2 + q_3 X_2^2) \quad (20)$$

where $X_2 = t_m^2 \, d_m^{-2} \, (1-0.043\ 65\ b_2)^{-2}$ and coefficients q_1, q_2, and q_3 for this method are given in Table 5.

3) Adjusted squared diameter ratio method:

This is a modification of method 2) and gives merchantable volume as a function of top diameter inside bark and stump height:

$$VM_e = V_e \, (r_1 + r_2 \, X_3 + r_3 \, X_3^2) \quad (21)$$

where $X_3 = (t_e/D_e)^2 \, (1 + S_e/H_e)$

r_1, r_2, r_3 = regression coefficients.

The metric equivalent of (21) is obtained by substitution of (3), (5), (7), (8), (9), and (12) in (21):

$$VM_m = V_m \, (r_1 + r_2 \, X_3 + r_3 \, X_3^2) \quad (22)$$

where $X_3 = t_m^2 \, d_m^{-2} \, (1-0.043\ 65\ b_2)^{-2} \, (1 + S_m/H_m)$.

The coefficients r_1, r_2, and r_3 for this method are listed in Table 6.

This method was used to produce a set of merchantable cubic metre volume tables for the 21 species (Appendix II) using a top diameter of 7.0 cm

inside bark and stump height of 0.15 m.

4) Diameter - height ratio method:

The fourth approach expresses merchantable volume as a function of top diameter inside bark and height to merchantable limit:

$$VM_e = V_e\ (Z_1 + Z_2\ X_4 + Z_3 X_5) \qquad (23)$$

where Z_1, Z_2, and Z_3 are regression coefficients, $X_4 = (t_e/D_e)$, and

$$X_5 = (1-h_e/H_e)^2$$

The metric version of this equation is obtained by substitution of (3), (4), (7), (8), (9), and (12) in (23):

$$VM_m = V_m\ (Z_1 + Z_2\ X_4 + Z_3 X_5) \qquad (24)$$

where $X_4 = t_m d_m^{-1}(1 - 0.043\ 65\ b_2)^{-1}$; $X_5 = (1-h_m/H_m)^2$ and coefficients Z_1, Z_2, and Z_3 are listed in Table 7.

METRIC VOLUME TABLES AND CONVERSION FACTORS

Total Cubic Metre Volume Tables

Total volume tables are presented in Appendix I and show volume in cubic metres of the entire stem inside bark including stump and top for 2-cm classes of diameter outside bark at breast height of 1.30 m, and selected tree heights. No allowances have been made for defect, trim, or breakage.

The total volume table for each species was computed using Equation 14 and the coefficients of Table 3. They show the volume equation, coefficients, accuracy at the 95% level, sample locations and number of trees observed.

Merchantable Cubic Metre Volume Tables

Merchantable volume tables are presented in Appendix II and show volume in cubic metres inside bark, less stump and top, for 2-cm classes of diameter outside bark at breast height of 1.30 m, and for selected tree heights. The specified merchantable limits are a 7.0 cm top diameter inside bark and a stump height of 0.15 m. No allowances have been made for defect, trim, or breakage. Conversion factors developed from method 3 (adjusted squared diameter ratio) and the species, softwood and hardwood coefficients applied to the volume equations were used to construct these tables.

Merchantable Cubic Metre Conversion Factors

Appendix III contains a set of tables giving the ratio of merchantable volume to total volume for different stump heights, top diameters, and merchantable lengths.

A table showing the distribution of volume over the tree stem is presented. The proportions of total tree volume are shown for ratios of section length to total tree height, and the squared ratio of top diameter inside bark to diameter breast height outside bark. The ratios are derived from the 'all species' coefficients of Tables 4 and 5 developed for the height ratio method and the squared diameter ratio method.

Appendix III also contains tables showing the proportion of total volume that can be recovered when merchantable limits are in terms of stump heights at 0.15 m and 0.30 m, merchantable lengths as a ratio of total tree height and the height classes are specified. These tables are useful in determining the merchantable volume of trees having damaged or broken tops.

The adjusted squared diameter ratio method and the all species coefficients of Table 6 were used to compute the ratios of merchantable volume to total volume for stump heights of 0.15 and 0.30 m and top diameters inside bark of 7.0, 11.0, 15.0, 19.0, 23.0 and 27.0 cm. These stump heights are characteristic of current harvesting practice and the diameters represent the lower limits of the 2-cm classes used in measuring logs for scaling purposes (Canadian Standards Association, 1977).

Accuracy

Tests of accuracy were performed in Canadian yard/pound units. In converting to metric systems, no further tests were undertaken as it is assumed that the error statements are generally applicable to both measurement systems.

1) Taper Coefficients

Ker (1974) discussed some of the errors associated with the b_2 taper coefficients and concluded that large changes in them produce very small changes in the volume estimates. However, in the absence of detailed tests the volume tables were derived using coefficients specific to each species. Where no coefficients were available, the 'all species' values were used.

2) Total Cubic Volume Tables

Accuracy limits are shown for each total cubic volume table and were computed in the manner described by Freese (1960). The limits at the 95% level are shown in percentages.

For the data used in constructing the table, the tabular volume estimates are within plus or minus P units of the true volume. For example, the tabular estimates of total cubic volume for individual lodgepole pine were within plus or minus 15.2% of the true volume 95% of the time.

3) Merchantable Volume Tables and Conversion Factors

Because it is difficult to estimate accuracy for every combination of stump height and top diameter, no limits are shown on the merchantable

volume tables or on the tables of merchantable conversion factors. However, tests were conducted on a limited amount of data and a description of the method follows.

For each of 10 species, 80 trees were selected at random and from the section measurements of each tree a merchantable top was randomly selected. Using the merchantable cubic conversion functions for each species, the softwoods, the hardwoods, and an expression for softwoods and hardwoods combined, the merchantable volume for each tree was computed using

(1) the total cubic volume as determined from the species total volume equation, and the conversion factor equations,

(2) the observed total cubic foot volume as determined from the sum of the section volumes, and the conversion factor equations.

The accuracy at the 95% level was determined and Tables 4 to 7 show the results for each method. In reviewing the accuracy statements it should be noted that those listed under column 1, incorporate the errors associated with the total volume function as well as those of the conversion factor equation. Those listed under column 2, incorporate the errors of the conversion factor equation only.

Application

A white pine tree has the following measurements and specifications: diameter breast height outside bark (d) is 40.2 cm; total height (H) is 25.60 m; stump height (S) is 0.45 m. The tree contains one sawlog of 15.00 m in length, the upper limit (h_1) being located at 18.00 m and the lower limit (h_2) at 3.00 m above ground level. Determine the total stem volume (V), the merchantable volume, the sawlog volume, and the merchantable volume to a top diameter inside bark (t) of 8.0 cm.

Total stem volume: Equation 14

$$V = 0.004\ 389\ 1\ d^2(1-0.043\ 65\ b_2)^2/(c_1 + 0.3048c_2/H)$$

$b_2 = 0.184$
$c_1 = 0.691$
$c_2 = 363.676$
$d = 40.2$ cm
$H = 25.60$ m
$V = 1.390$ m³

Sawlog volume: Equation 18

$$Vs = V(p_2((h_1/H)-(h_2/H)) + p_3((h_1/H)^2-(h_2/H)^2))$$

$V = 1.390$ m³
$p_2 = 2.1164$
$p_3 = -1.1387$
$h_1 = 18.00$ m
$h_2 = 3.00$ m
$H = 25.60$ m
$V_s = 0.963$ m³

Merchantable stem volume: Equation 22

$$VM = V(r_1 + r_2X_3 + r_3X_3^2)$$

$X_3 = t^2d^{-2}(1-0.043\ 65\ b_2)^{-2}\ (1+S/H)$
$V = 1.390\ m^3$
$r_1 = 0.9735$
$r_2 = -0.2348$
$r_3 = -0.7378$
$t = 8.0\ cm$
$d = 40.2\ cm$
$b_2 = 0.184$
$S = 0.45\ m$
$H = 25.60\ m$
$V_m = 1.338\ m^3$

Volume summary

Total volume	1.390 m^3
Merchantable volume	1.338 m^3
Sawlog volume	0.963 m^3
Pulp volume	0.375 m^3
Unmerchantable volume	0.052 m^3

BREAST HEIGHT AND STUMP DIAMETER EQUATIONS

In almost every phase of forestry, breast-height diameter is one of the commonly used measurements. It is needed to establish tree size, to estimate basal area, volume, mass and increment of trees, and to describe stand structure. Breast-height diameter is generally measured directly, however in some cases it must be estimated from other measured variables such as stump-height diameter. For instance, when it is necessary to compute the volume of a stand removed following a harvesting operation, the conversion from stump diameter and stump height to breast-height diameter would be required to apply the appropriate local volume table. On the other hand, the estimation of stump diameter from breast-height diameter may be required to evaluate close utilization limits associated with mechanized harvesting techniques.

Model Development

The radius of the bole at stump height ($DS_e/2$) and breast height ($D_e/2$) were plotted against stump height plus one ($S_e+1.0$) for individual sample trees. Since it was found that the curve shape of the lower trunk varies with D_e as well as with the logarithm of the ratio of breast height plus 1.0 to stump height plus 1.0, a combined variable was used in developing the equations of the following forms:

$$DS_e = D_e + b_1D_e\ \ln(5.5/(S_e + 1)) \qquad (25)$$

$$D_e = DS_e + b_2 DS_e \ln((S_e + 1)/5.5) \quad (26)$$

Double bark thickness was assumed to be in the form

$$dbt_e = a + b\, D_e \quad (27)$$

and subtracting from both sides of Eq. (25) gives

$$DSI_e = b_3 + b_4 D_e + b_5\, D_e \ln(5.5/(S_e + 1)) \quad (28)$$

In the same way, the expression for breast height diameter outside bark was written as

$$D_e = b_6 + b_7 DSI_e + b_8 DSI_e \ln((S_e + 1)/5.5) \quad (29)$$

Metric Diameter Equations

The conversion of equations 25, 26, 28, 29 is accomplished as follows:

Let $\ln(5.5/(S_e + 1)) = \ln(5.5/(3.280\ 84\ S_m + 1))$ (30)

and $\ln((S_e + 1)/5.5) = \ln((3.280\ 84\ S_m + 1)/5.5)$ (31)

$$DSI_e = 0.393\ 701\ DSI_m \quad (32)$$

Substituting Eq. (6), (12), and (30) in (25); Eq. (6), (12), and (31) in (26); Eq. (32), (12), and (30) in (28); Eq. (32), (12), and (31) in (29) gives

$$DS_m = d_m (1-0.043\ 65\ b_2)(1 + b_1 \ln(1.6764/(S_m + 0.3048))) \quad (33)$$

$$d_m = DS_m (1 + b_2 \ln((S_m+0.3048)/1.6764))/(1-0.043\ 65\ b_2) \quad (34)$$

$$DSI_m = b_3 + d_m (1-0.043\ 65\ b_2)(b_4 + b_5 \ln(1.6764/(S_m+0.3048))) \quad (35)$$

$$d_m = (b_6 + DSI_m (b_7 + b_8 \ln((S_m+0.3048)/1.6764)))/(1-0.043\ 65\ b_2) \quad (36)$$

The coefficients b_1 to b_8 for these diameter equations are listed in Table 8, and were used to produce the outside and inside bark diameters at various stump heights for Appendices IV to VII. Note that, for $S_m = 1.30$ m,

Eq. 33 produces $DS_m = d_m$,
Eq. 34 produces $d_m = DS_m$,
Eq. 35 simplifies to $DSI_m = b_3 + k_1 d_m$, and
Eq. 36 simplifies to $d_m = (b_6 + k_2\ DSI_m)/k_3$,
where $k_1 = k_3\ (b_4 + 0.043\ 65\ b_5)$
$k_2 = b_7 - 0.043\ 65\ b_8$
$k_3 = 1 - 0.043\ 65\ b_2$

ACKNOWLEDGMENT

The authors wish to acknowledge the contribution of Mr. R. Piirvee of the Petawawa National Forestry Institute to the conversion processes used in this manuscript.

REFERENCES

Alemdag, I.S. and Honer T.G. 1973. Relationships between breast-height and stump diameters for eleven tree species from eastern and central Canada. Can. For. Serv., For. Manage. Inst., Inf. Rep. FMR-X-49

Alemdag, I.S. and Honer T.G. 1977. Metric relationships between breast-height and stump diameters for eleven tree species from eastern and central Canada. Can. For. Serv., For. Manage. Inst., Inf. Rep. FMR-X-49M

Anon. 1930. Form-Class Volume Tables. For. Serv. Dep. Int., Ottawa, Canada

Anon. 1948. Form-Class Volume Tables (2nd ed.) Dom. For. Serv., Dep. Mines Res., Ottawa, Canada

Bruce, D. 1979. Effects of metrication on analyses and summaries of forest measurements. pp. 812-829 In Forest Resource Inventories Workshop Proceedings, Colorado State University, Fort Collins, Colorado, July 23-26, 1979.

Canadian Standards Association, 1977. Standard CAN3-0302.1-M77, Scaling Roundwood. Canadian Standards Association, Rexdale, Ontario

Damaerschalk, J.P. 1972. Conversion of taper and volume equations from the English to the metric system. Can. J. For. Res. 2: 372-374

Freese, F. 1960. Testing Accuracy. Forest Sci., 6:130-145

Honer, T.G. 1964. The use of height and squared diameter ratios for the estimation of merchantable cubic foot volume. For. Chron. 40:324-331

Honer, T.G. 1965a. Volume distribution in individual trees. Woodlands Review Section, Pulp and Paper Magazine of Canada. Woodlands Section Index 2349 (F-2).

Honer, T.G. 1965b. A new total cubic foot volume function. For. Chron., 41: 476-493.

Honer, T.G. 1967. Standard volume tables and merchantable conversion factors for the commercial tree species of central and eastern Canada. Can. Dep. For. Rural Dev., For. Manage. Res. and Serv. Inst., Inf. Rep. FMR-X-5

Ker, M.F. 1974. Metric tree volume tables for Newfoundland. Can. For. Serv., Nfld. For. Res. Cent., Inf. Rep. N-X-122

MacLeod, D.A. 1978. The Forest Management Institute tree data bank. Can. For. Serv., For. Manage. Inst., Inf. Rep. FMR-X-112

Smith, B.M. 1975. Metric conversion. In Canadian Forest Inventory Methods, Workshop Proceedings, June 1975, Dorset, Ontario. University of Toronto Press.

LIST OF TABLES

1. Variables, symbols, and measurement units used in derivation of metric volume equations.

2. Regression coefficients for Alemdag and Honer's (1973) taper model; equation 10.

3. Regression coefficients for Honer's (1967) total cubic-foot volume equation, and equation 14.

4. Merchantable volume conversion factor coefficients for height ratio method; equation 15.

5. Merchantable volume conversion factor coefficients for squared diameter ratio method; equation 20.

6. Merchantable volume conversion factor coefficients for adjusted squared diameter ratio method; equation 22.

7. Merchantable volume conversion factor coefficients for diameter-height ratio method; equation 24.

8. Regression coefficients for stump and breast height diameters; equations 33 to 36.

Table 1. Variables, symbols and measurement units used in derivation of metric volume equations

Variable	Symbol		Measurement units	
	English	Metric	English	Metric
1) Diameter outside bark at 4.5 ft. above ground	D_e	D_m	inches	cm
2) Diameter outside bark at 1.3 m above ground	d_e	d_m	inches	cm
3) Total height	H_e	H_m	feet	m
4) Height to merchantable limit	h_e	h_m	feet	m
5) Stump height	S_e	S_m	feet	m
6) Stump diameter outside bark	DS_e	DS_m	inches	cm
6.1) Stump diameter inside bark	DSI_e	DSI_m	inches	cm
7) Top diameter inside bark	t_e	t_m	inches	cm
8) Total volume	V_e	V_m	cubic feet	m^3
9) Merchantable volume	VM_e	VM_m	cubic feet	m^3

Table 2. Regression coefficients for Alemdag and Honer's (1973) taper model; equation 10

Species	No. of observations	Regression coefficient b_2	R^2	Standard error of estimate	
				$S_{y.x}$	% of $\bar{Y}$
Eastern white pine	599	0.184	0.996	0.896	7.04
Red pine	740	0.151	0.997	0.573	6.07
Jack pine	1472	0.151	0.996	0.483	7.00
Lodgepole pine	748	0.118	0.997	0.500	5.44
Black spruce	723	0.164	0.996	0.454	6.42
Red spruce	73	0.169	0.997	0.506	6.05
White spruce	646	0.176	0.993	0.972	9.34
Balsam fir	355	0.152	0.997	0.463	5.95
Poplar	541	0.127	0.996	0.575	6.75
White birch	149	0.176	0.996	0.558	6.59
Yellow birch	151	0.181	0.995	0.883	7.76
Mean softwood*	-	0.155	-	-	-
Mean hardwood*	-	0.145	-	-	-
Mean all species*	-	0.154	-	-	-

Equation 10: $D_e = DS_e + b_2 DS_e \ln((S_e+1)/5.5)$

where D_e = DBHob at 4.5 ft; DS_e = diameter outside bark at stump height; S_e = stump height; ln = natural logarithm.

*b_2 is the weighted average

Table 3. Regression coefficients for Honer's (1967) total cubic-metre volume; equation 14

Species	No. of Trees	Regression coeffieincts			% Accuracy*
		b_2	c_1	c_2	
White pine	1169	0.184	0.691	363.676	± 16.5
Red pine	1333	0.151	0.710	355.623	± 17.3
Jack pine	6166	0.151	0.897	348.530	± 15.5
Lodgepole pine	850	0.118	0.694	343.896	± 15.2
Black spruce	7442	0.164	1.588	333.364	± 17.0
Red spruce	227	0.169	1.226	315.832	± 13.6
White spruce	2692	0.176	1.440	342.175	± 17.9
Balsam fir	2768	0.152	2.139	301.634	± 17.8
Eastern white cedar	187	0.155	4.167	244.906	± 16.4
Eastern hemlock	383	0.155	1.112	350.092	± 23.6
Trembling aspen	800	0.127	-0.312	436.683	± 17.9
Balsam poplar	2421	0.127	0.420	394.644	± 18.3
White birch	1272	0.176	2.222	300.373	± 22.5
Yellow birch	1733	0.181	1.449	344.754	± 34.3
Maple	3967	0.145	1.046	383.972	± 30.3
Basswood	140	0.145	0.948	401.456	± 25.5
Beech	388	0.145	0.959	334.829	± 25.1
Black cherry	21	0.145	0.033	393.336	± 19.8
White elm	62	0.145	0.634	440.496	± 28.1
Ironwood	147	0.145	1.877	332.585	± 23.6
Red oak	40	0.145	1.512	336.509	± 13.8

*Freese, F. 1960. Testing Accuracy. For. Sci. 6: 130-145.

Equation 14. $V_m = 0.004\ 389\ 1\ d_m^2\ (1-0.043\ 65\ b_2)^2/(c_1+(0.3048c_2/H_m))$

where V_m = total cubic volume; d_m = DBHob; H_m = total height.

Table 4. Merchantable volume conversion factor coefficients for height ratio method; equation 15

Species	Regression coefficients				R^2	Standard error of estimate	% Accuracy *	
	b_2	p_1	p_2	p_3			1	2
White pine	0.184	0.0145	2.1164	- 1.1387	99.42	0.025	± 15.8	± 5.6
Red pine	0.151	0.0145	2.0347	- 1.0473	99.18	0.029	± 14.9	± 4.4
Jack pine	0.151	0.0760	1.6446	- 0.6019	96.81	0.057	± 23.4	± 8.4
Lodgepole pine	0.118	0.0098	2.0442	- 1.0562	99.40	0.025	± 12.6	± 5.8
Black spruce	0.164	0.0204	2.1534	- 1.1918	99.55	0.021	± 15.1	± 3.4
Red spruce	0.169	0.0202	2.1149	- 1.1465	99.33	0.025	Not tested	
White spruce	0.176	0.0236	2.2191	- 1.2705	99.46	0.024	± 17.2	± 5.0
Balsam fir	0.152	0.0117	2.1931	- 1.2230	99.53	0.021	± 17.1	± 7.8
Softwoods	0.155	0.0155	2.1158	- 1.1419	99.22	0.028	± 17.6	± 6.0
Poplar	0.127	0.0085	2.0945	- 1.1055	99.44	0.022	± 10.8	± 6.2
White birch	0.176	0.0232	2.2582	- 1.3268	98.44	0.035	± 25.7	± 7.1
Yellow birch	0.181	0.0248	2.4729	- 1.6199	97.80	0.042	± 30.6	± 7.5
Hardwoods	0.145	0.0161	2.2378	- 1.2990	97.94	0.042	± 24.1	± 9.3
All species	0.154	0.0159	2.1331	- 1.1631	99.02	0.031	± 19.9	± 7.4

Percent accuracy: column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 16. $VM_m = V_m (p_1 + p_2(h_m/H_m) + p_3(h_m/H_m)^2)$

where VM_m = merchantable volume; V_m = total cubic volume; h_m = height to merchantable limit; H_m = total height.

Table 5. Merchantable volume conversion factor coefficients for squared diameter ratio method; equation 20

Species	Regression coefficients				R^2	Standard error of estimate	% Accuracy	
	b_2	q_1	q_2	q_3			1	2
White pine	0.184	1.0180	-0.2323	- 0.7736	87.27	0.080	± 23.2	± 10.7
Red pine	0.151	1.0073	-0.0461	- 1.0794	89.73	0.072	± 21.7	± 9.4
Jack pine	0.151	1.0081	-0.1476	- 0.8455	89.17	0.072	± 22.2	± 7.8
Lodgepole pine	0.118	1.0130	-0.1254	- 0.8553	91.99	0.062	± 17.4	± 6.1
Black spruce	0.164	1.0038	-0.1022	- 0.8572	93.39	0.055	± 19.7	± 6.0
Red spruce	0.169	1.0086	-0.1014	- 0.7933	88.94	0.067	Not tested	
White spruce	0.176	1.0114	-0.2422	- 0.7177	91.76	0.061	± 22.5	± 7.6
Balsam fir	0.152	0.9976	-0.0532	- 0.8439	94.84	0.048	± 21.6	± 9.5
Softwoods	0.155	1.0119	-0.1642	- 0.8289	89.88	0.070	± 23.2	± 9.3
Poplar	0.127	0.9794	0.0787	- 1.1865	94.29	0.059	± 21.1	± 13.8
White birch	0.176	1.0060	-0.2687	- 0.6071	84.82	0.087	± 31.3	± 11.0
Yellow birch	0.181	0.9921	-0.2492	- 0.5793	86.28	0.080	± 34.8	± 8.9
Hardwoods	0.145	0.9928	-0.1184	- 0.8565	88.49	0.080	± 31.4	± 11.8
All species	0.154	1.0106	-0.1641	- 0.8266	89.78	0.071	± 26.8	± 10.3

Per cent accuracy: column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 20: $VM_m = V_m(q_1 + q_2X_2 + q_3X_2^2)$

where VM_m = merchantable volume; V_m = total cubic volume; $X_2 = t_m^2 d_m^{-2}(1-0.043\ 65\ b_2)^{-2}$
t_m = top diameter inside bark; d_m = DBHob.

Table 6. Merchantable volume conversion factor coefficients for adjusted squared diameter ratio method; equation 22

Species	Regression coefficients				R^2	Standard error of estimate	% Accuracy*	
	b_2	r_1	r_2	r_3			1	2
White pine	0.184	0.9735	-0.2348	- 0.7378	86.20	0.083	± 24.6	± 12.1
Red pine	0.151	0.9672	-0.0393	- 1.0523	89.18	0.074	± 22.5	± 10.4
Jack pine	0.151	0.9635	-0.1500	- 0.8081	88.49	0.074	± 24.4	± 11.3
Lodgepole pine	0.118	0.9658	-0.1278	- 0.8108	91.59	0.064	± 18.1	± 7.1
Black spruce	0.164	0.9526	-0.1027	- 0.8199	92.84	0.057	± 20.7	± 7.3
Red spruce	0.169	0.9644	-0.0995	- 0.7658	88.61	0.068	Not tested	
White spruce	0.176	0.9611	-0.2456	- 0.6801	91.54	0.062	± 21.9	± 7.4
Balsam fir	0.152	0.9352	-0.0395	- 0.8147	93.95	0.052	± 20.9	± 6.8
Softwoods	0.155	0.9645	-0.1616	- 0.7945	89.09	0.072	± 23.7	± 10.1
Poplar	0.127	0.9354	0.0957	- 1.1613	93.68	0.062	± 22.6	± 15.0
White birch	0.176	0.9087	-0.3049	- 0.5107	82.25	0.095	± 35.7	± 15.4
Yellow birch	0.181	0.8778	-0.2417	- 0.5247	83.32	0.089	± 39.2	± 14.0
Hardwoods	0.145	0.9057	-0.0708	- 0.8375	86.15	0.087	± 37.6	± 16.3
All species	0.154	0.9604	-0.1660	- 0.7868	88.66	0.076	± 31.1	± 13.5

*Per cent accuracy: Column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 22: $VM_m = V_m(r_1 + r_2X_3 + r_3X_3^2)$

where VM_m = merchantable volume; V_m = total cubic volume; $X_3 = t_m^2 d_m^{-2} (1-0.043\ 65\ b_2)^{-2} (1+S_m/H_m)$

t_m = top diameter inside bark; d_m = DBHob; S_m = stump height; H_m = total height.

Table 7. Merchantable volume conversion factor coefficients for diameter-height ratio method; equation 24

Species	Regression coefficients b_2	Z_1	Z_2	Z_3	R^2	Standard error of estimate	% Accuracy* 1	2
White pine	0.184	1.0120	0.0291	- 1.0012	98.35	0.029	± 15.6	± 5.8
Red pine	0.151	1.0244	-0.0303	- 0.9620	97.97	0.032	± 15.7	± 4.6
Jack pine	0.151	1.1439	-0.4059	- 0.5165	86.98	0.079	± 25.4	± 9.6
Lodgepole pine	0.118	1.0277	-0.0451	- 0.9461	98.57	0.026	± 13.0	± 5.6
Black spruce	0.164	1.0099	0.0376	- 0.9826	98.68	0.024	± 15.3	± 4.0
Red spruce	0.169	1.0088	0.0293	- 0.9828	98.25	0.026	Not tested	
White spruce	0.176	1.0133	0.0478	- 0.9699	98.26	0.028	± 17.4	± 5.0
Balsam fir	0.152	1.0116	0.0470	- 1.0019	98.54	0.025	± 17.4	± 8.2
Softwoods	0.155	1.0222	-0.0072	- 0.9597	97.91	0.032	± 18.1	± 6.2
Poplar	0.127	1.0444	-0.0395	- 0.9790	99.06	0.024	± 11.4	± 5.8
White birch	0.176	1.0823	-0.0819	- 0.9057	97.20	0.037	± 27.7	± 7.2
Yellow birch	0.181	1.1157	-0.1204	- 0.8526	95.53	0.046	± 34.6	± 7.7
Hardwoods	0.145	1.0979	-0.1285	- 0.8925	96.54	0.044	± 27.1	± 8.5
All species	0.154	1.0297	-0.0211	- 0.9462	97.57	0.035	± 20.4	± 7.7

*Percent accuracy: Column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 24: $VM_m = V_m(Z_1 + Z_2X_4 + Z_3X_5)$

VM_m = merchantable volume; V_m = total cubic volume; $X_4 = t_m d_m^{-1} (1-0.043\ 65\ b_2)^{-1}$;

$X_5 = (1-h_m/H_m)^2$; t_m = top diameter inside bark; d_m = DBHob

h_m = height to merchantable limit; H_m = total height.

Table 8. Regression coefficients for stump and breast height diameters; equations 33 to 36

Tree species	Regression coefficients							
	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8
Eastern white pine	0.216	0.184	0.036	0.916	0.188	0.617	1.072	0.190
Red pine	0.178	0.151	0.196	0.913	0.148	0.135	1.082	0.151
Jack pine	0.176	0.151	-0.455	0.961	0.118	0.721	1.027	0.117
Lodgepole pine	0.130	0.118	-0.338	0.966	0.114	0.490	1.028	0.112
Black spruce	0.194	0.164	-0.478	0.965	0.168	0.937	1.013	0.157
Red spruce	0.201	0.169	-0.185	0.953	0.193	0.424	1.037	0.177
White spruce	0.206	0.176	-0.843	0.984	0.190	1.372	0.997	0.169
Balsam fir	0.176	0.152	-0.333	0.962	0.127	0.960	1.008	0.122
Poplar spp.	0.140	0.127	-0.693	0.964	0.111	0.853	1.032	0.114
White birch	0.196	0.176	0.112	0.942	0.175	0.241	1.045	0.174
Yellow birch	0.198	0.181	-0.071	0.946	0.183	0.577	1.040	0.185
Mean softwood*	0.181	0.155	-0.332	0.953	0.146	0.716	1.033	0.142
Mean hardwood*	0.160	0.145	-0.439	0.957	0.135	0.695	1.036	0.137
Mean all species*	0.178	0.154	-0.346	0.954	0.145	0.713	1.033	0.141

Equation 33: $DS_m = d_m(1-0.043\ 65\ b_2)\ (1+b_1\ \ln(1.6764/(S_m+0.3048)))$.

Equation 34: $d_m = DS_m\ (1+b_2\ \ln((S_m+0.3048)/1.6764))/(1-0.043\ 65\ b_2)$.

Equation 35: $DSI_m = b_3+d_m\ (1-0.043\ 65\ b_2)(b_4+b_5\ \ln(1.6764/(S_m+0.3048)))$.

Equation 36: $d_m = (b_6+DSI_m(b_7+b_8\ \ln((S_m+0.3048)/1.6764)))/(1-0.043\ 65\ b_2)$.

where DS_m = diameter outside bark at stump height

DSI_m = diameter inside bark at stump height

S_m = stump height

d_m = DBHob at 1.30 m

ln = natural logarithm

*weighted averages.

APPENDIX I Total Cubic Metre Volume Tables

SPECIES	PAGE
Eastern white pine (Pinus strobus L.)	24
Red pine (Pinus resinosa Ait.)	25
Jack pine (Pinus banksiana Lamb.)	26
Lodgepole pine (Pinus contorta Dougl. var. latifolia Engelm.)	27
Black spruce (Picea mariana (Mill.) B.S.P.)	28
Red spruce (Picea rubens Sarg.)	29
White spruce (Picea glauca (Moench) Voss.)	30
Balsam fir (Abies balsamea (L.) (Mill.))	31
Eastern white cedar (Thuja occidentalis L.)	32
Eastern hemlock (Tsuga canadensis (L.) Carr.)	33
Trembling aspen (Populus tremuloides Michx.)	34
Balsam poplar (Populus balsamifera L.)	35
White birch (Betula papyrifera Marsh.)	36
Yellow birch (Betula alleghaniensis Britt.)	37
Maple (Acer L.)	38
Basswood (Tilia americana L.)	39
Beech (Fagus grandifolia Ehrh.)	40
Black cherry (Prunus serotina Ehrh.)	41
White elm (Ulmus americana L.)	42
Ironwood (Ostrya virginiana (Mill.) K. Koch)	43
Red oak (Quercus rubra L.)	44

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

EASTERN WHITE PINE / PINUS STROBUS L.

DBH CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.009	0.009						
6	0.007	0.013	0.019	0.020	0.023	0.025				
8	0.012	0.023	0.034	0.036	0.040	0.044				
10	0.019	0.037	0.053	0.057	0.063	0.069	0.075	0.081		
12	0.027	0.053	0.077	0.082	0.091	0.100	0.109	0.117		
14	0.037	0.072	0.105	0.111	0.124	0.136	0.148	0.159	0.165	0.193
16	0.048	0.094	0.137	0.145	0.161	0.177	0.193	0.208	0.216	0.252
18		0.119	0.173	0.184	0.204	0.224	0.244	0.264	0.273	0.319
20		0.147	0.214	0.227	0.252	0.277	0.302	0.325	0.337	0.394
22		0.178	0.259	0.274	0.305	0.335	0.365	0.394	0.408	0.477
24		0.211	0.308	0.327	0.363	0.399	0.434	0.469	0.485	0.567
26			0.361	0.383	0.426	0.468	0.510	0.550	0.570	0.666
28			0.419	0.444	0.494	0.543	0.591	0.638	0.661	0.772
30			0.481	0.510	0.568	0.624	0.678	0.732	0.758	0.886
32			0.547	0.580	0.646	0.709	0.772	0.833	0.863	1.008
34			0.618	0.655	0.729	0.801	0.871	0.940	0.974	1.138
36			0.693	0.735	0.817	0.898	0.977	1.054	1.092	1.276
38			0.772	0.819	0.911	1.000	1.088	1.175	1.217	1.422
40			0.855	0.907	1.009	1.109	1.206	1.301	1.348	1.576
42			0.943	1.000	1.112	1.222	1.330	1.435	1.487	1.737
44			1.036	1.097	1.221	1.341	1.459	1.575	1.632	1.906
46			1.131	1.199	1.334	1.466	1.595	1.721	1.783	2.084
48			1.231	1.306	1.453	1.596	1.737	1.874	1.942	2.269
50				1.417	1.576	1.732	1.884	2.033	2.107	2.462
52				1.533	1.705	1.873	2.038	2.199	2.279	2.663
54				1.653	1.839	2.020	2.198	2.372	2.457	2.871
56				1.778	1.977	2.173	2.364	2.551	2.643	3.088
58						2.331	2.536	2.736	2.835	3.313
60						2.494	2.714	2.928	3.034	3.545
62						2.663	2.898	3.127	3.239	3.785
64						2.838	3.088	3.332	3.452	4.033
66							3.284	3.543	3.671	4.289
68							3.486	3.761	3.897	4.553
70							3.694	3.986	4.129	4.825
72							3.908	4.217	4.369	5.105
74							4.128	4.454	4.615	5.392

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.184 ; C1 = 0.691 ; C2 = 363.676

DATA SOURCE: 1165 TREES FROM N.B., QUE., ONT.
ACCURACY: + OR - 16.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

RED PINE / PINUS RESINOSA AIT.

DBHCB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.009	0.009						
6	0.007	0.014	0.020	0.021	0.023	0.025				
8	0.012	0.024	0.035	0.037	0.041	0.045				
10	0.019	0.038	0.055	0.058	0.064	0.071	0.077	0.083		
12	0.028	0.054	0.079	0.083	0.093	0.102	0.111	0.119		
14	0.038	0.074	0.107	0.113	0.126	0.138	0.151	0.162	0.168	0.196
16	0.050	0.096	0.140	0.148	0.165	0.181	0.197	0.212	0.220	0.256
18		0.122	0.177	0.188	0.208	0.229	0.249	0.269	0.278	0.325
20		0.150	0.218	0.231	0.257	0.283	0.307	0.332	0.343	0.401
22		0.182	0.264	0.280	0.311	0.342	0.372	0.401	0.415	0.485
24		0.216	0.314	0.333	0.371	0.407	0.443	0.477	0.494	0.577
26			0.369	0.391	0.435	0.478	0.519	0.560	0.580	0.677
28			0.428	0.454	0.504	0.554	0.602	0.650	0.673	0.786
30			0.491	0.521	0.579	0.636	0.692	0.746	0.773	0.902
32			0.559	0.593	0.659	0.724	0.787	0.849	0.879	1.026
34			0.631	0.669	0.744	0.817	0.888	0.958	0.992	1.158
36			0.707	0.750	0.834	0.916	0.996	1.074	1.113	1.298
38			0.788	0.836	0.929	1.020	1.110	1.197	1.240	1.447
40			0.873	0.926	1.029	1.131	1.229	1.326	1.373	1.603
42			0.963	1.021	1.135	1.246	1.355	1.462	1.514	1.767
44			1.057	1.120	1.246	1.363	1.488	1.604	1.662	1.940
46			1.155	1.225	1.361	1.485	1.626	1.754	1.816	2.120
48			1.257	1.333	1.482	1.628	1.770	1.909	1.978	2.308
50				1.447	1.609	1.767	1.921	2.072	2.146	2.505
52				1.565	1.740	1.911	2.078	2.241	2.321	2.709
54				1.688	1.876	2.061	2.241	2.417	2.503	2.922
56				1.815	2.018	2.216	2.410	2.599	2.692	3.142
58						2.377	2.585	2.788	2.888	3.370
60						2.544	2.766	2.984	3.090	3.607
62						2.716	2.954	3.186	3.300	3.851
64						2.894	3.147	3.395	3.516	4.104
66							3.347	3.610	3.739	4.364
68							3.553	3.832	3.969	4.633
70							3.765	4.061	4.206	4.909
72							3.983	4.296	4.450	5.194
74							4.208	4.538	4.701	5.487

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.151 ; C1 = 0.710 ; C2 = 355.623

DATA SOURCE: 1333 TREES FROM N.B.,QUE., ONT.
ACCURACY: + OR - 17.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

JACK PINE / PINUS BANKSIANA LAMB.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	19	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.009	0.009						
6	0.007	0.014	0.020	0.021	0.023	0.025				
8	0.013	0.024	0.035	0.037	0.041	0.045				
10	0.020	0.038	0.054	0.057	0.064	0.070	0.076	0.081		
12	0.028	0.054	0.078	0.083	0.092	0.100	0.109	0.117		
14	0.038	0.074	0.106	0.113	0.125	0.137	0.148	0.159	0.165	0.191
16	0.050	0.096	0.139	0.147	0.163	0.179	0.194	0.208	0.215	0.250
18		0.122	0.176	0.186	0.206	0.226	0.245	0.264	0.273	0.316
20		0.150	0.217	0.230	0.256	0.279	0.303	0.325	0.337	0.390
22		0.182	0.263	0.278	0.308	0.338	0.366	0.394	0.407	0.472
24		0.217	0.313	0.331	0.367	0.402	0.436	0.469	0.485	0.562
26			0.367	0.389	0.431	0.472	0.511	0.550	0.569	0.660
28			0.426	0.451	0.499	0.547	0.592	0.638	0.660	0.765
30			0.489	0.517	0.573	0.628	0.681	0.732	0.757	0.878
32			0.556	0.589	0.652	0.714	0.775	0.833	0.862	0.999
34			0.628	0.664	0.736	0.806	0.874	0.941	0.973	1.128
36			0.704	0.745	0.826	0.904	0.980	1.055	1.091	1.265
38			0.784	0.830	0.920	1.007	1.092	1.175	1.215	1.409
40			0.869	0.920	1.019	1.116	1.210	1.302	1.347	1.562
42			0.958	1.014	1.124	1.231	1.334	1.435	1.485	1.722
44			1.051	1.113	1.233	1.351	1.465	1.575	1.629	1.889
46			1.149	1.216	1.348	1.476	1.601	1.722	1.781	2.065
48			1.251	1.324	1.468	1.607	1.743	1.875	1.939	2.249
50				1.437	1.593	1.744	1.891	2.034	2.104	2.440
52				1.554	1.723	1.886	2.046	2.200	2.276	2.639
54				1.676	1.858	2.034	2.206	2.373	2.454	2.846
56				1.802	1.998	2.188	2.372	2.552	2.639	3.061
58						2.347	2.545	2.737	2.831	3.283
60						2.512	2.723	2.929	3.030	3.514
62						2.682	2.908	3.128	3.236	3.752
64						2.858	3.099	3.333	3.447	3.998
66							3.295	3.544	3.666	4.251
68							3.498	3.762	3.892	4.513
70							3.707	3.987	4.124	4.782
72							3.922	4.218	4.363	5.059
74							4.143	4.456	4.609	5.344

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.151 ; C1 = 0.897 ; C2 = 348.530

DATA SOURCE: 6166 TREES FROM QUE., ONT., MAN., SASK.
ACCURACY: + OR - 15.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.005	0.010						
6	0.007	0.014	0.020	0.022	0.024	0.026				
8	0.013	0.025	0.036	0.038	0.043	0.047				
10	0.020	0.039	0.057	0.060	0.067	0.073	0.080	0.086		
12	0.029	0.056	0.081	0.086	0.096	0.105	0.115	0.124		
14	0.039	0.076	0.111	0.118	0.131	0.143	0.156	0.168	0.174	0.203
16	0.051	0.100	0.145	0.153	0.171	0.187	0.204	0.220	0.228	0.266
18		0.126	0.183	0.194	0.216	0.237	0.258	0.278	0.288	0.336
20		0.155	0.226	0.240	0.267	0.293	0.318	0.343	0.356	0.415
22		0.188	0.274	0.290	0.323	0.354	0.385	0.415	0.430	0.502
24		0.224	0.326	0.345	0.384	0.422	0.458	0.494	0.512	0.597
26			0.382	0.405	0.451	0.495	0.538	0.580	0.601	0.701
28			0.443	0.470	0.523	0.574	0.624	0.673	0.697	0.813
30			0.509	0.540	0.600	0.659	0.716	0.772	0.800	0.934
32			0.579	0.614	0.683	0.749	0.815	0.879	0.910	1.062
34			0.654	0.693	0.771	0.846	0.920	0.992	1.028	1.199
36			0.733	0.777	0.864	0.949	1.031	1.112	1.152	1.344
38			0.817	0.866	0.962	1.057	1.149	1.239	1.284	1.498
40			0.905	0.959	1.066	1.171	1.273	1.373	1.422	1.660
42			0.998	1.058	1.176	1.291	1.404	1.514	1.568	1.830
44			1.095	1.161	1.290	1.417	1.541	1.662	1.721	2.008
46			1.197	1.269	1.410	1.549	1.684	1.816	1.881	2.195
48			1.303	1.381	1.536	1.686	1.834	1.977	2.048	2.390
50				1.499	1.666	1.830	1.990	2.146	2.222	2.593
52				1.621	1.802	1.979	2.152	2.321	2.404	2.805
54				1.748	1.944	2.134	2.321	2.503	2.592	3.025
56				1.880	2.090	2.295	2.496	2.691	2.788	3.253
58						2.462	2.677	2.887	2.990	3.489
60						2.635	2.865	3.090	3.200	3.734
62						2.814	3.059	3.299	3.417	3.987
64						2.998	3.260	3.515	3.641	4.249
66							3.467	3.739	3.872	4.518
68							3.680	3.969	4.110	4.796
70							3.900	4.205	4.356	5.083
72							4.126	4.449	4.608	5.377
74							4.358	4.700	4.868	5.680

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.118 ; C1 = 0.694 ; C2 = 343.696

DATA SOURCE: 850 TREES FROM ALTA.
ACCURACY: + OR - 15.2 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

BLACK SPRUCE / PICEA MARIANA (MILL.) P.S.P.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.007	0.013	0.019	0.020	0.022	0.023				
8	0.013	0.024	0.033	0.035	0.038	0.042				
10	0.020	0.037	0.052	0.054	0.060	0.065	0.070	0.074		
12	0.028	0.053	0.075	0.078	0.086	0.093	0.100	0.107		
14	0.039	0.072	0.101	0.107	0.117	0.127	0.137	0.146	0.150	0.170
16	0.051	0.094	0.132	0.140	0.153	0.166	0.178	0.190	0.196	0.223
18		0.119	0.168	0.177	0.194	0.210	0.226	0.241	0.248	0.282
20		0.147	0.207	0.218	0.239	0.260	0.279	0.297	0.306	0.348
22		0.178	0.250	0.264	0.290	0.314	0.337	0.360	0.370	0.421
24		0.212	0.298	0.314	0.345	0.374	0.402	0.428	0.441	0.501
26			0.350	0.368	0.404	0.439	0.471	0.502	0.517	0.588
28			0.406	0.427	0.469	0.509	0.547	0.583	0.600	0.682
30			0.466	0.490	0.538	0.584	0.627	0.669	0.689	0.783
32			0.530	0.558	0.613	0.664	0.714	0.761	0.784	0.891
34			0.598	0.630	0.691	0.750	0.806	0.859	0.885	1.005
36			0.671	0.706	0.775	0.841	0.903	0.963	0.992	1.127
38			0.747	0.787	0.864	0.937	1.007	1.073	1.105	1.256
40			0.828	0.872	0.957	1.038	1.115	1.189	1.225	1.391
42			0.913	0.961	1.055	1.144	1.230	1.311	1.350	1.534
44			1.002	1.055	1.158	1.256	1.350	1.439	1.482	1.684
46			1.095	1.153	1.266	1.373	1.475	1.573	1.620	1.840
48			1.192	1.256	1.378	1.495	1.606	1.712	1.764	2.004
50				1.362	1.495	1.622	1.743	1.858	1.914	2.174
52				1.474	1.617	1.754	1.885	2.010	2.070	2.352
54				1.589	1.744	1.892	2.033	2.167	2.232	2.536
56				1.709	1.876	2.035	2.186	2.331	2.400	2.727
58						2.183	2.345	2.500	2.575	2.925
60						2.336	2.509	2.675	2.756	3.131
62						2.494	2.680	2.857	2.942	3.343
64						2.657	2.855	3.044	3.135	3.562
66							3.036	3.237	3.334	3.788
68							3.223	3.436	3.539	4.021
70							3.416	3.641	3.751	4.261
72							3.614	3.853	3.968	4.508
74							3.817	4.070	4.191	4.762

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.164 ; C1 = 1.588 ; C2 = 333.364

DATA SOURCE: 7442 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.
ACCURACY: + OR - 17.0 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

RED SPRUCE / PICEA RUBENS SARG.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.009	0.010						
6	0.008	0.014	0.020	0.021	0.024	0.026				
8	0.014	0.026	0.036	0.038	0.042	0.046				
10	0.021	0.040	0.057	0.060	0.066	0.072	0.077	0.083		
12	0.030	0.057	0.081	0.086	0.095	0.103	0.111	0.119		
14	0.041	0.078	0.111	0.117	0.129	0.140	0.151	0.162	0.167	0.191
16	0.054	0.102	0.145	0.153	0.168	0.183	0.198	0.211	0.218	0.250
18		0.129	0.183	0.193	0.213	0.232	0.250	0.268	0.276	0.316
20		0.159	0.226	0.239	0.263	0.286	0.309	0.330	0.341	0.390
22		0.193	0.274	0.289	0.318	0.347	0.374	0.400	0.412	0.472
24		0.230	0.326	0.344	0.379	0.412	0.445	0.476	0.491	0.562
26			0.382	0.404	0.445	0.484	0.522	0.558	0.576	0.659
28			0.444	0.468	0.516	0.561	0.605	0.647	0.668	0.765
30			0.509	0.537	0.592	0.644	0.695	0.743	0.767	0.878
32			0.579	0.611	0.674	0.733	0.791	0.846	0.872	0.999
34			0.654	0.690	0.760	0.828	0.892	0.955	0.985	1.127
36			0.733	0.774	0.853	0.928	1.001	1.070	1.104	1.264
38			0.817	0.862	0.950	1.034	1.115	1.192	1.230	1.408
40			0.905	0.955	1.053	1.146	1.235	1.321	1.363	1.560
42			0.998	1.053	1.160	1.263	1.362	1.457	1.503	1.720
44			1.095	1.156	1.274	1.386	1.495	1.599	1.649	1.888
46			1.197	1.263	1.392	1.515	1.634	1.747	1.803	2.063
48			1.304	1.376	1.516	1.650	1.779	1.903	1.963	2.247
50				1.493	1.645	1.790	1.930	2.064	2.130	2.438
52				1.615	1.779	1.936	2.088	2.233	2.303	2.637
54				1.741	1.918	2.088	2.251	2.408	2.484	2.843
56				1.873	2.063	2.246	2.421	2.590	2.671	3.058
58						2.409	2.597	2.778	2.866	3.280
60						2.578	2.779	2.973	3.067	3.510
62						2.753	2.968	3.174	3.275	3.748
64						2.933	3.162	3.382	3.489	3.994
66							3.363	3.597	3.711	4.248
68							3.570	3.818	3.939	4.509
70							3.783	4.046	4.174	4.778
72							4.002	4.281	4.416	5.055
74							4.228	4.522	4.665	5.340

EQUATION: $V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)$

WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.169 ; C1 = 1.226 ; C2 = 315.832

DATA SOURCE: 227 TREES FROM N.B.

ACCURACY: + OR - 13.6 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.007	0.013	0.019	0.020	0.022	0.023				
8	0.012	0.023	0.033	0.035	0.038	0.042				
10	0.019	0.036	0.051	0.054	0.060	0.065	0.070	0.075		
12	0.028	0.052	0.074	0.078	0.086	0.094	0.101	0.108		
14	0.038	0.071	0.101	0.106	0.117	0.127	0.137	0.146	0.151	0.172
16	0.050	0.093	0.132	0.139	0.153	0.166	0.179	0.191	0.197	0.225
18		0.118	0.167	0.176	0.194	0.210	0.227	0.242	0.250	0.285
20		0.146	0.206	0.217	0.239	0.260	0.280	0.299	0.308	0.352
22		0.176	0.249	0.263	0.289	0.314	0.338	0.362	0.373	0.425
24		0.210	0.297	0.313	0.344	0.374	0.403	0.430	0.444	0.506
26			0.348	0.367	0.404	0.439	0.473	0.505	0.521	0.594
28			0.404	0.426	0.468	0.509	0.548	0.586	0.604	0.689
30			0.463	0.489	0.538	0.585	0.629	0.672	0.693	0.791
32			0.527	0.556	0.612	0.665	0.716	0.765	0.789	0.900
34			0.595	0.628	0.691	0.751	0.808	0.864	0.890	1.016
36			0.667	0.704	0.774	0.842	0.906	0.968	0.998	1.139
38			0.744	0.784	0.863	0.938	1.010	1.079	1.112	1.269
40			0.824	0.869	0.956	1.039	1.119	1.195	1.232	1.407
42			0.908	0.958	1.054	1.146	1.233	1.318	1.359	1.551
44			0.997	1.051	1.157	1.257	1.354	1.446	1.491	1.702
46			1.090	1.149	1.264	1.374	1.480	1.581	1.630	1.860
48			1.186	1.251	1.376	1.496	1.611	1.721	1.774	2.025
50				1.358	1.494	1.624	1.748	1.868	1.925	2.193
52				1.468	1.615	1.756	1.891	2.020	2.082	2.377
54				1.584	1.742	1.894	2.039	2.178	2.246	2.563
56				1.703	1.874	2.037	2.193	2.343	2.415	2.757
58						2.185	2.352	2.513	2.591	2.957
60						2.338	2.517	2.689	2.773	3.165
62						2.496	2.688	2.872	2.960	3.379
64						2.660	2.864	3.060	3.156	3.601
66							3.046	3.254	3.355	3.829
68							3.233	3.454	3.561	4.065
70							3.426	3.660	3.774	4.307
72							3.625	3.872	3.992	4.557
74							3.829	4.091	4.217	4.814

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.176 ; C1 = 1.440 ; C2 = 342.175

DATA SOURCE: 2692 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.
ACCURACY: + OR - 17.9 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.008	0.014	0.019	0.020	0.022	0.023				
8	0.014	0.024	0.034	0.035	0.038	0.041				
10	0.021	0.038	0.052	0.055	0.060	0.064	0.069	0.073		
12	0.030	0.055	0.075	0.079	0.086	0.093	0.099	0.104		
14	0.041	0.075	0.103	0.108	0.117	0.126	0.134	0.142	0.146	0.163
16	0.054	0.098	0.134	0.141	0.153	0.165	0.175	0.186	0.191	0.213
18		0.124	0.170	0.178	0.194	0.208	0.220	0.235	0.241	0.270
20		0.153	0.210	0.220	0.239	0.257	0.274	0.290	0.298	0.333
22		0.185	0.254	0.266	0.289	0.311	0.332	0.351	0.360	0.403
24		0.220	0.302	0.316	0.344	0.370	0.395	0.418	0.429	0.479
26			0.354	0.371	0.404	0.435	0.463	0.490	0.503	0.563
28			0.411	0.431	0.469	0.504	0.537	0.569	0.584	0.653
30			0.471	0.494	0.538	0.579	0.617	0.653	0.670	0.749
32			0.536	0.562	0.612	0.658	0.702	0.743	0.762	0.852
34			0.606	0.635	0.691	0.743	0.792	0.839	0.861	0.962
36			0.679	0.712	0.775	0.833	0.889	0.940	0.965	1.079
38			0.756	0.793	0.863	0.928	0.990	1.048	1.075	1.202
40			0.838	0.879	0.956	1.029	1.097	1.161	1.191	1.332
42			0.924	0.969	1.054	1.134	1.209	1.280	1.313	1.468
44			1.014	1.063	1.157	1.245	1.327	1.405	1.442	1.611
46			1.108	1.162	1.265	1.361	1.451	1.535	1.576	1.761
48			1.207	1.266	1.377	1.481	1.579	1.672	1.716	1.918
50				1.373	1.494	1.607	1.714	1.814	1.862	2.081
52				1.485	1.616	1.739	1.854	1.962	2.013	2.251
54				1.602	1.743	1.875	1.999	2.116	2.171	2.427
56				1.723	1.874	2.016	2.150	2.275	2.335	2.610
58						2.163	2.306	2.441	2.505	2.800
60						2.315	2.468	2.612	2.681	2.996
62						2.472	2.635	2.789	2.862	3.199
64						2.634	2.808	2.972	3.050	3.409
66							2.986	3.160	3.244	3.626
68							3.170	3.355	3.443	3.849
70							3.359	3.555	3.649	4.078
72							3.554	3.761	3.860	4.315
74							3.754	3.973	4.077	4.558

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.152 ; C1 = 2.139 ; C2 = 301.634

DATA SOURCE: 2768 TREES FROM NFLD., N.B., QUE., MAN., SASK.
ACCURACY: + OR - 17.8 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

EASTERN WHITE CEDAR / THUJA OCCIDENTALIS L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.004	0.006	0.008	0.008						
6	0.008	0.013	0.017	0.018	0.019	0.020				
8	0.015	0.024	0.030	0.031	0.033	0.035				
10	0.023	0.037	0.047	0.049	0.052	0.055	0.057	0.059		
12	0.033	0.054	0.068	0.071	0.075	0.079	0.082	0.086		
14	0.044	0.073	0.093	0.096	0.102	0.107	0.112	0.117	0.119	0.128
16	0.058	0.095	0.121	0.125	0.133	0.140	0.147	0.152	0.155	0.167
18		0.121	0.153	0.159	0.169	0.178	0.186	0.193	0.196	0.211
20		0.149	0.189	0.196	0.208	0.219	0.229	0.238	0.242	0.260
22		0.180	0.229	0.237	0.252	0.265	0.277	0.288	0.293	0.315
24		0.214	0.273	0.282	0.300	0.316	0.330	0.343	0.349	0.375
26			0.320	0.331	0.352	0.371	0.387	0.402	0.409	0.440
28			0.371	0.384	0.408	0.430	0.449	0.466	0.475	0.510
30			0.426	0.441	0.469	0.493	0.515	0.535	0.545	0.586
32			0.485	0.502	0.533	0.561	0.586	0.609	0.620	0.666
34			0.547	0.567	0.602	0.634	0.662	0.688	0.700	0.752
36			0.614	0.635	0.675	0.710	0.742	0.771	0.785	0.843
38			0.684	0.708	0.752	0.792	0.827	0.859	0.874	0.939
40			0.758	0.784	0.833	0.877	0.916	0.952	0.969	1.041
42			0.835	0.865	0.919	0.967	1.010	1.050	1.068	1.148
44			0.917	0.949	1.008	1.061	1.109	1.152	1.172	1.260
46			1.002	1.037	1.102	1.160	1.212	1.259	1.281	1.377
48			1.091	1.129	1.200	1.263	1.320	1.371	1.395	1.499
50				1.226	1.302	1.370	1.432	1.487	1.513	1.627
52				1.326	1.408	1.482	1.549	1.609	1.637	1.759
54				1.430	1.519	1.598	1.670	1.735	1.765	1.897
56				1.537	1.633	1.719	1.796	1.866	1.898	2.040
58						1.844	1.927	2.002	2.036	2.189
60						1.973	2.062	2.142	2.179	2.342
62						2.107	2.202	2.287	2.327	2.501
64						2.245	2.346	2.437	2.479	2.665
66							2.495	2.592	2.637	2.834
68							2.649	2.751	2.799	3.008
70							2.806	2.915	2.966	3.188
72							2.969	3.084	3.138	3.373
74							3.135	3.258	3.315	3.563

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.155 ; C1 = 4.167 ; C2 = 244.906

DATA SOURCE: 187 TREES FROM QUE., ONT.
ACCURACY: + OR - 16.4 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

EASTERN HEMLOCK / TSUGA CANADENSIS (L.) CARR.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.007	0.013	0.019	0.020	0.022	0.024				
8	0.012	0.024	0.034	0.036	0.039	0.043				
10	0.019	0.037	0.053	0.056	0.062	0.067	0.073	0.078		
12	0.028	0.053	0.076	0.080	0.089	0.097	0.105	0.112		
14	0.038	0.072	0.103	0.109	0.121	0.132	0.142	0.153	0.158	0.182
16	0.049	0.094	0.135	0.142	0.157	0.172	0.186	0.199	0.206	0.237
18		0.119	0.171	0.180	0.199	0.218	0.235	0.252	0.261	0.300
20		0.147	0.211	0.223	0.246	0.269	0.290	0.312	0.322	0.371
22		0.178	0.255	0.269	0.298	0.325	0.351	0.377	0.390	0.449
24		0.212	0.303	0.321	0.354	0.387	0.418	0.449	0.464	0.534
26			0.356	0.376	0.416	0.454	0.491	0.527	0.544	0.627
28			0.413	0.436	0.482	0.527	0.569	0.611	0.631	0.727
30			0.474	0.501	0.554	0.604	0.654	0.701	0.724	0.835
32			0.539	0.570	0.630	0.688	0.744	0.798	0.824	0.950
34			0.608	0.643	0.711	0.776	0.839	0.901	0.930	1.072
36			0.682	0.721	0.797	0.870	0.941	1.010	1.043	1.202
38			0.760	0.804	0.888	0.970	1.049	1.125	1.162	1.339
40			0.842	0.890	0.984	1.075	1.162	1.246	1.288	1.484
42			0.929	0.982	1.085	1.185	1.281	1.374	1.420	1.636
44			1.019	1.077	1.191	1.300	1.406	1.508	1.558	1.795
46			1.114	1.177	1.301	1.421	1.537	1.648	1.703	1.962
48			1.213	1.282	1.417	1.547	1.673	1.795	1.854	2.137
50				1.391	1.538	1.679	1.816	1.948	2.012	2.318
52				1.505	1.663	1.816	1.964	2.106	2.176	2.508
54				1.623	1.793	1.958	2.118	2.272	2.347	2.704
56				1.745	1.929	2.106	2.277	2.443	2.524	2.908
58						2.259	2.443	2.621	2.707	3.120
60						2.418	2.614	2.804	2.897	3.339
62						2.582	2.792	2.995	3.094	3.565
64						2.751	2.975	3.191	3.296	3.799
66							3.163	3.393	3.506	4.040
68							3.358	3.602	3.721	4.288
70							3.558	3.817	3.943	4.544
72							3.765	4.038	4.172	4.808
74							3.977	4.266	4.407	5.078

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.155 ; C1 = 1.112 ; C2 = 350.092

DATA SOURCE: 383 TREES FROM ONT.
ACCURACY: + OR - 23.6 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

TREMBLING ASPEN / POPULUS TREMULOIDES MICHX.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.005	0.008	0.009						
6	0.006	0.012	0.018	0.020	0.022	0.025				
8	0.011	0.021	0.032	0.035	0.039	0.044				
10	0.016	0.033	0.051	0.054	0.061	0.068	0.076	0.083		
12	0.024	0.048	0.073	0.078	0.088	0.099	0.109	0.119		
14	0.032	0.065	0.099	0.106	0.120	0.134	0.148	0.163	0.170	0.206
16	0.042	0.085	0.130	0.139	0.157	0.175	0.194	0.212	0.222	0.269
18		0.108	0.164	0.176	0.199	0.222	0.245	0.269	0.281	0.341
20		0.134	0.203	0.217	0.245	0.274	0.303	0.332	0.346	0.421
22		0.162	0.245	0.262	0.297	0.331	0.366	0.401	0.419	0.509
24		0.192	0.292	0.312	0.353	0.394	0.436	0.478	0.499	0.606
26			0.343	0.366	0.414	0.463	0.511	0.561	0.585	0.711
28			0.397	0.425	0.480	0.536	0.593	0.650	0.679	0.825
30			0.456	0.488	0.552	0.616	0.681	0.746	0.779	0.947
32			0.519	0.555	0.628	0.701	0.775	0.849	0.887	1.078
34			0.586	0.627	0.708	0.791	0.874	0.959	1.001	1.217
36			0.657	0.703	0.794	0.887	0.980	1.075	1.122	1.364
38			0.732	0.783	0.885	0.988	1.092	1.198	1.251	1.520
40			0.811	0.867	0.981	1.095	1.210	1.327	1.386	1.684
42			0.894	0.956	1.081	1.207	1.334	1.463	1.528	1.856
44			0.982	1.050	1.186	1.325	1.464	1.606	1.677	2.037
46			1.073	1.147	1.297	1.448	1.601	1.755	1.833	2.227
48			1.168	1.249	1.412	1.577	1.743	1.911	1.995	2.425
50				1.355	1.532	1.711	1.891	2.073	2.165	2.631
52				1.466	1.657	1.850	2.045	2.242	2.342	2.846
54				1.581	1.787	1.995	2.206	2.418	2.525	3.069
56				1.700	1.922	2.146	2.372	2.601	2.716	3.300
58						2.302	2.545	2.790	2.913	3.540
60						2.463	2.723	2.986	3.118	3.788
62						2.630	2.908	3.188	3.329	4.045
64						2.803	3.098	3.397	3.547	4.310
66							3.295	3.613	3.772	4.584
68							3.498	3.835	4.005	4.866
70							3.707	4.064	4.244	5.156
72							3.921	4.299	4.489	5.455
74							4.142	4.541	4.742	5.763

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.127 ; C1 = -0.312 ; C2 = 436.683

DATA SOURCE: 800 TREES FROM QUE., ONT., MAN., SASK.
ACCURACY: + OR - 17.9 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

BALSAM POPLAR / POPULUS BALSAMIFERA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.006	0.013	0.019	0.020	0.022	0.024				
8	0.011	0.022	0.033	0.035	0.039	0.043				
10	0.018	0.035	0.051	0.055	0.061	0.067	0.074	0.080		
12	0.026	0.050	0.074	0.079	0.088	0.097	0.106	0.115		
14	0.035	0.068	0.101	0.107	0.120	0.132	0.144	0.157	0.163	0.192
16	0.045	0.089	0.132	0.140	0.156	0.173	0.189	0.205	0.212	0.251
18		0.113	0.167	0.177	0.198	0.219	0.239	0.259	0.269	0.317
20		0.139	0.206	0.219	0.244	0.270	0.295	0.320	0.332	0.392
22		0.169	0.249	0.265	0.296	0.327	0.357	0.387	0.402	0.474
24		0.201	0.296	0.315	0.352	0.389	0.425	0.460	0.478	0.564
26			0.348	0.370	0.413	0.456	0.498	0.540	0.561	0.662
28			0.403	0.429	0.479	0.529	0.578	0.626	0.650	0.768
30			0.463	0.492	0.550	0.607	0.664	0.719	0.747	0.882
32			0.527	0.560	0.626	0.691	0.755	0.818	0.850	1.003
34			0.595	0.632	0.706	0.780	0.852	0.924	0.959	1.133
36			0.667	0.709	0.792	0.874	0.955	1.036	1.075	1.270
38			0.743	0.790	0.882	0.974	1.065	1.154	1.198	1.415
40			0.823	0.875	0.978	1.079	1.180	1.279	1.328	1.568
42			0.907	0.965	1.078	1.190	1.300	1.410	1.464	1.729
44			0.996	1.059	1.183	1.306	1.427	1.547	1.606	1.897
46			1.088	1.157	1.293	1.427	1.560	1.691	1.756	2.073
48			1.185	1.260	1.408	1.554	1.699	1.841	1.912	2.258
50				1.367	1.528	1.686	1.843	1.998	2.074	2.450
52				1.479	1.652	1.824	1.993	2.161	2.244	2.650
54				1.595	1.782	1.967	2.150	2.330	2.419	2.857
56				1.715	1.916	2.116	2.312	2.506	2.602	3.073
58						2.269	2.480	2.688	2.791	3.296
60						2.429	2.654	2.877	2.987	3.528
62						2.593	2.834	3.072	3.189	3.767
64						2.763	3.020	3.273	3.398	4.014
66							3.211	3.481	3.614	4.268
68							3.409	3.695	3.837	4.531
70							3.612	3.915	4.066	4.802
72							3.822	4.142	4.301	5.080
74							4.037	4.376	4.543	5.366

EQUATION: V = (0.00436*1*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.127 ; C1 = 0.420 ; C2 = 394.644

DATA SOURCE: 2421 TREES FROM ONT.
ACCURACY: + OR - 18.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DBHCE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.008	0.014	0.019	0.020	0.021	0.023				
8	0.013	0.024	0.033	0.035	0.038	0.041				
10	0.021	0.038	0.052	0.054	0.059	0.064	0.068	0.072		
12	0.030	0.055	0.075	0.078	0.085	0.092	0.097	0.103		
14	0.041	0.074	0.102	0.107	0.116	0.125	0.133	0.140	0.144	0.161
16	0.054	0.097	0.133	0.139	0.151	0.163	0.173	0.183	0.188	0.210
18		0.123	0.168	0.176	0.192	0.206	0.219	0.232	0.238	0.266
20		0.152	0.208	0.218	0.237	0.254	0.271	0.286	0.294	0.328
22		0.184	0.251	0.263	0.286	0.308	0.328	0.347	0.355	0.397
24		0.219	0.299	0.313	0.341	0.366	0.390	0.412	0.423	0.472
26			0.351	0.368	0.400	0.430	0.458	0.484	0.497	0.554
28			0.407	0.427	0.464	0.498	0.531	0.561	0.576	0.642
30			0.467	0.490	0.532	0.572	0.609	0.644	0.661	0.738
32			0.532	0.557	0.606	0.651	0.693	0.733	0.752	0.839
34			0.600	0.629	0.684	0.735	0.783	0.828	0.849	0.947
36			0.673	0.705	0.766	0.824	0.877	0.928	0.952	1.062
38			0.750	0.786	0.854	0.918	0.978	1.034	1.061	1.183
40			0.831	0.870	0.946	1.017	1.083	1.145	1.175	1.311
42			0.916	0.960	1.043	1.121	1.194	1.263	1.296	1.446
44			1.005	1.053	1.145	1.231	1.311	1.386	1.422	1.587
46			1.098	1.151	1.251	1.345	1.433	1.515	1.554	1.734
48			1.196	1.253	1.363	1.464	1.560	1.650	1.692	1.888
50				1.360	1.478	1.589	1.693	1.790	1.836	2.049
52				1.471	1.599	1.719	1.831	1.936	1.986	2.216
54				1.586	1.724	1.853	1.974	2.088	2.142	2.390
56				1.706	1.855	1.993	2.123	2.245	2.303	2.570
58						2.138	2.278	2.408	2.471	2.757
60						2.288	2.437	2.577	2.644	2.950
62						2.443	2.603	2.752	2.823	3.150
64						2.603	2.773	2.932	3.009	3.357
66							2.949	3.119	3.199	3.570
68							3.131	3.310	3.396	3.789
70							3.318	3.508	3.599	4.016
72							3.510	3.711	3.808	4.248
74							3.707	3.920	4.022	4.488

EQUATION: V = (C.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = C.176 ; C1 = 2.222 ; C2 = 300.373

DATA SOURCE: 1272 TREES FROM QUE., ONT., ALTA.
ACCURACY: + OR - 22.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.007	0.013	0.018	0.019	0.021	0.023				
8	0.012	0.023	0.033	0.034	0.038	0.041				
10	0.019	0.036	0.051	0.054	0.059	0.064	0.069	0.074		
12	0.028	0.052	0.074	0.078	0.085	0.093	0.100	0.107		
14	0.038	0.071	0.100	0.106	0.116	0.126	0.136	0.145	0.150	0.171
16	0.049	0.092	0.131	0.138	0.152	0.165	0.178	0.190	0.196	0.223
18		0.117	0.166	0.175	0.192	0.209	0.225	0.240	0.248	0.283
20		0.145	0.204	0.216	0.237	0.258	0.278	0.297	0.306	0.349
22		0.175	0.247	0.261	0.287	0.312	0.336	0.359	0.370	0.422
24		0.208	0.294	0.310	0.341	0.371	0.400	0.427	0.440	0.503
26			0.345	0.364	0.401	0.436	0.469	0.501	0.517	0.590
28			0.401	0.422	0.465	0.505	0.544	0.581	0.599	0.684
30			0.460	0.485	0.534	0.580	0.625	0.667	0.688	0.785
32			0.523	0.552	0.607	0.660	0.711	0.759	0.783	0.893
34			0.591	0.623	0.685	0.745	0.802	0.857	0.884	1.009
36			0.662	0.698	0.768	0.835	0.899	0.961	0.991	1.131
38			0.738	0.778	0.856	0.931	1.002	1.070	1.104	1.260
40			0.818	0.862	0.949	1.031	1.110	1.186	1.223	1.396
42			0.901	0.951	1.046	1.137	1.224	1.308	1.348	1.539
44			0.989	1.043	1.148	1.248	1.343	1.435	1.480	1.689
46			1.081	1.140	1.254	1.364	1.468	1.569	1.617	1.846
48			1.177	1.242	1.366	1.485	1.599	1.708	1.761	2.010
50				1.347	1.482	1.611	1.735	1.853	1.911	2.181
52				1.457	1.603	1.743	1.876	2.005	2.067	2.359
54				1.571	1.729	1.879	2.024	2.162	2.229	2.544
56				1.690	1.859	2.021	2.176	2.325	2.397	2.736
58						2.168	2.334	2.494	2.571	2.935
60						2.320	2.498	2.669	2.751	3.141
62						2.477	2.667	2.850	2.938	3.354
64						2.640	2.842	3.036	3.131	3.573
66							3.023	3.229	3.329	3.800
68							3.209	3.428	3.534	4.034
70							3.400	3.633	3.745	4.275
72							3.597	3.843	3.962	4.523
74							3.800	4.060	4.185	4.777

EQUATION: V = (0.00438*1*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.181 ; C1 = 1.449 ; C2 = 344.754

DATA SOURCE: 1733 TREES FROM QUE., ONT.
ACCURACY: + OR - 34.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

MAPLE / ACER L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.005	0.008	0.008						
6	0.006	0.012	0.018	0.019	0.021	0.023				
8	0.011	0.022	0.031	0.033	0.037	0.040				
10	0.018	0.034	0.049	0.052	0.057	0.063	0.068	0.073		
12	0.026	0.049	0.071	0.075	0.083	0.090	0.098	0.105		
14	0.035	0.067	0.096	0.102	0.113	0.123	0.133	0.143	0.148	0.172
16	0.045	0.087	0.125	0.133	0.147	0.161	0.174	0.187	0.194	0.224
18		0.110	0.159	0.168	0.186	0.204	0.221	0.237	0.245	0.284
20		0.136	0.196	0.207	0.230	0.251	0.272	0.293	0.303	0.350
22		0.165	0.237	0.251	0.278	0.304	0.330	0.354	0.366	0.424
24		0.196	0.282	0.299	0.331	0.362	0.392	0.421	0.436	0.505
26			0.331	0.350	0.388	0.425	0.460	0.495	0.512	0.592
28			0.384	0.406	0.450	0.493	0.534	0.574	0.593	0.687
30			0.441	0.467	0.517	0.565	0.613	0.659	0.681	0.788
32			0.502	0.531	0.588	0.643	0.697	0.749	0.775	0.897
34			0.566	0.599	0.664	0.726	0.787	0.846	0.875	1.013
36			0.635	0.672	0.744	0.814	0.882	0.948	0.981	1.135
38			0.707	0.748	0.829	0.907	0.983	1.057	1.093	1.265
40			0.784	0.829	0.919	1.005	1.089	1.171	1.211	1.402
42			0.864	0.914	1.013	1.108	1.201	1.291	1.335	1.545
44			0.948	1.004	1.112	1.216	1.318	1.417	1.465	1.696
46			1.036	1.097	1.215	1.329	1.441	1.548	1.601	1.854
48			1.128	1.194	1.323	1.448	1.569	1.686	1.743	2.018
50				1.296	1.435	1.571	1.702	1.829	1.892	2.190
52				1.402	1.553	1.699	1.841	1.979	2.046	2.369
54				1.511	1.674	1.832	1.985	2.134	2.206	2.554
56				1.626	1.801	1.970	2.135	2.295	2.373	2.747
58						2.114	2.290	2.462	2.545	2.947
60						2.262	2.451	2.634	2.724	3.154
62						2.415	2.617	2.813	2.909	3.367
64						2.573	2.788	2.997	3.099	3.588
66							2.966	3.187	3.296	3.816
68							3.148	3.384	3.499	4.051
70							3.336	3.586	3.708	4.292
72							3.529	3.793	3.923	4.541
74							3.728	4.007	4.143	4.797

EQUATION: V = (0.0043891*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 1.046 ; C2 = 383.972

DATA SOURCE: 3967 TREES FROM ONT.
ACCURACY: + OR - 30.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

BASSWOOD / TILIA AMERICANA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.005	0.008	0.008						
6	0.006	0.012	0.017	0.018	0.020	0.022				
8	0.011	0.021	0.030	0.032	0.036	0.039				
10	0.017	0.033	0.048	0.050	0.056	0.061	0.067	0.072		
12	0.025	0.047	0.069	0.073	0.081	0.088	0.096	0.103		
14	0.033	0.064	0.093	0.099	0.110	0.120	0.130	0.140	0.145	0.169
16	0.044	0.084	0.122	0.129	0.143	0.157	0.170	0.183	0.190	0.221
18		0.106	0.154	0.163	0.181	0.199	0.216	0.232	0.240	0.279
20		0.131	0.190	0.202	0.224	0.245	0.266	0.287	0.297	0.345
22		0.159	0.230	0.244	0.271	0.297	0.322	0.347	0.359	0.417
24		0.189	0.274	0.290	0.322	0.353	0.383	0.413	0.427	0.497
26			0.322	0.341	0.378	0.415	0.450	0.485	0.501	0.583
28			0.373	0.395	0.439	0.481	0.522	0.562	0.582	0.676
30			0.428	0.454	0.504	0.552	0.599	0.645	0.668	0.776
32			0.487	0.516	0.573	0.628	0.682	0.734	0.760	0.883
34			0.550	0.583	0.647	0.709	0.770	0.829	0.857	0.997
36			0.617	0.653	0.725	0.795	0.863	0.929	0.961	1.117
38			0.687	0.728	0.808	0.886	0.961	1.035	1.071	1.245
40			0.762	0.807	0.895	0.981	1.065	1.147	1.187	1.379
42			0.840	0.889	0.987	1.082	1.174	1.264	1.308	1.521
44			0.921	0.976	1.083	1.187	1.289	1.388	1.436	1.669
46			1.007	1.067	1.184	1.298	1.409	1.517	1.570	1.824
48			1.097	1.162	1.289	1.413	1.534	1.651	1.709	1.986
50				1.260	1.399	1.533	1.664	1.792	1.854	2.155
52				1.363	1.513	1.658	1.800	1.938	2.006	2.331
54				1.470	1.631	1.788	1.941	2.090	2.163	2.514
56				1.581	1.755	1.923	2.088	2.248	2.326	2.704
58						2.063	2.239	2.411	2.495	2.900
60						2.208	2.397	2.580	2.670	3.104
62						2.358	2.559	2.755	2.851	3.314
64						2.512	2.727	2.936	3.038	3.531
66							2.900	3.122	3.231	3.755
68							3.078	3.314	3.430	3.986
70							3.262	3.512	3.635	4.224
72							3.451	3.716	3.845	4.469
74							3.645	3.925	4.062	4.721

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 0.948 ; C2 = 401.456

DATA SOURCE: 140 TREES FROM ONT.
ACCURACY: + OR - 25.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

BEECH / FAGUS GRANDIFOLIA EHRH.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.009	0.009						
6	0.007	0.014	0.020	0.021	0.024	0.026				
8	0.013	0.025	0.036	0.038	0.042	0.046				
10	0.020	0.039	0.056	0.059	0.065	0.071	0.077	0.083		
12	0.029	0.056	0.080	0.085	0.094	0.103	0.111	0.120		
14	0.040	0.076	0.109	0.116	0.128	0.140	0.152	0.163	0.168	0.195
16	0.052	0.099	0.143	0.151	0.167	0.183	0.198	0.213	0.220	0.254
18		0.126	0.181	0.191	0.212	0.232	0.251	0.269	0.279	0.322
20		0.155	0.223	0.236	0.262	0.286	0.310	0.333	0.344	0.398
22		0.188	0.270	0.286	0.316	0.346	0.375	0.402	0.416	0.481
24		0.224	0.322	0.340	0.377	0.412	0.446	0.479	0.495	0.572
26			0.377	0.399	0.442	0.483	0.523	0.562	0.581	0.672
28			0.438	0.463	0.513	0.560	0.607	0.652	0.674	0.779
30			0.502	0.532	0.588	0.643	0.697	0.748	0.774	0.894
32			0.572	0.605	0.669	0.732	0.793	0.852	0.880	1.018
34			0.645	0.683	0.756	0.826	0.895	0.961	0.994	1.149
36			0.724	0.765	0.847	0.927	1.003	1.078	1.114	1.288
38			0.806	0.853	0.944	1.032	1.118	1.201	1.241	1.435
40			0.893	0.945	1.046	1.144	1.239	1.331	1.375	1.590
42			0.985	1.042	1.153	1.261	1.366	1.467	1.516	1.753
44			1.081	1.143	1.266	1.384	1.499	1.610	1.664	1.924
46			1.181	1.250	1.383	1.513	1.638	1.760	1.819	2.103
48			1.286	1.361	1.506	1.647	1.784	1.916	1.981	2.290
50				1.477	1.634	1.787	1.935	2.079	2.149	2.484
52				1.597	1.768	1.933	2.093	2.249	2.325	2.687
54				1.722	1.906	2.085	2.257	2.425	2.507	2.898
56				1.852	2.050	2.242	2.428	2.608	2.696	3.116
58						2.405	2.604	2.797	2.892	3.343
60						2.574	2.787	2.994	3.095	3.578
62						2.748	2.976	3.197	3.305	3.820
64						2.928	3.171	3.406	3.521	4.071
66							3.372	3.622	3.745	4.329
68							3.580	3.845	3.975	4.595
70							3.793	4.075	4.212	4.869
72							4.013	4.311	4.456	5.152
74							4.239	4.554	4.707	5.442

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 0.959 ; C2 = 334.829

DATA SOURCE: 388 TREES FROM ONT.
ACCURACY: + OR - 25.1 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

BLACK CHERRY / PRUNUS SEROTINA EHRH.

DBHCE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.009	0.009						
6	0.006	0.013	0.015	0.021	0.023	0.026				
8	0.012	0.023	0.035	0.037	0.041	0.046				
10	0.018	0.036	0.054	0.058	0.065	0.072	0.079	0.086		
12	0.026	0.052	0.078	0.083	0.093	0.104	0.114	0.124		
14	0.035	0.071	0.106	0.113	0.127	0.141	0.155	0.169	0.176	0.211
16	0.046	0.092	0.138	0.147	0.166	0.184	0.202	0.221	0.230	0.275
18		0.117	0.175	0.187	0.210	0.233	0.256	0.279	0.291	0.348
20		0.144	0.216	0.230	0.259	0.288	0.316	0.345	0.359	0.430
22		0.174	0.261	0.279	0.313	0.348	0.383	0.417	0.434	0.521
24		0.208	0.311	0.332	0.373	0.414	0.455	0.496	0.517	0.620
26			0.365	0.389	0.438	0.486	0.534	0.583	0.607	0.727
28			0.423	0.451	0.508	0.564	0.620	0.676	0.704	0.843
30			0.486	0.518	0.583	0.647	0.711	0.776	0.808	0.968
32			0.553	0.590	0.663	0.736	0.809	0.883	0.919	1.101
34			0.624	0.666	0.748	0.831	0.914	0.996	1.038	1.243
36			0.700	0.746	0.839	0.932	1.024	1.117	1.163	1.394
38			0.780	0.831	0.935	1.038	1.141	1.245	1.296	1.553
40			0.864	0.921	1.036	1.150	1.265	1.379	1.436	1.721
42			0.953	1.016	1.142	1.268	1.394	1.520	1.583	1.897
44			1.045	1.115	1.253	1.392	1.530	1.669	1.738	2.082
46			1.143	1.218	1.370	1.521	1.673	1.824	1.899	2.276
48			1.244	1.327	1.492	1.657	1.821	1.986	2.068	2.478
50				1.440	1.619	1.797	1.976	2.155	2.244	2.689
52				1.557	1.751	1.944	2.137	2.330	2.427	2.908
54				1.679	1.888	2.097	2.305	2.513	2.617	3.136
56				1.806	2.030	2.255	2.479	2.703	2.815	3.373
58						2.419	2.659	2.899	3.019	3.618
60						2.588	2.846	3.103	3.231	3.872
62						2.764	3.039	3.313	3.450	4.134
64						2.945	3.238	3.530	3.676	4.405
66							3.443	3.754	3.910	4.685
68							3.655	3.985	4.150	4.973
70							3.873	4.223	4.398	5.270
72							4.098	4.468	4.653	5.576
74							4.329	4.720	4.915	5.890

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 0.033 ; C2 = 393.336

DATA SOURCE: 21 TREES FROM ONT.
ACCURACY: + OR - 19.8 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

WHITE ELM / ULMUS AMERICANA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.005	0.007	0.008						
6	0.006	0.011	0.016	0.017	0.019	0.021				
8	0.010	0.020	0.029	0.031	0.034	0.038				
10	0.016	0.031	0.045	0.048	0.054	0.059	0.064	0.070		
12	0.023	0.044	0.065	0.069	0.077	0.085	0.093	0.100		
14	0.031	0.060	0.089	0.094	0.105	0.116	0.126	0.136	0.141	0.166
16	0.040	0.079	0.116	0.123	0.137	0.151	0.165	0.178	0.185	0.217
18		0.100	0.146	0.156	0.173	0.191	0.208	0.225	0.234	0.275
20		0.123	0.181	0.192	0.214	0.236	0.257	0.278	0.289	0.339
22		0.149	0.219	0.232	0.259	0.285	0.311	0.337	0.349	0.411
24		0.178	0.260	0.277	0.308	0.340	0.371	0.401	0.416	0.489
26			0.306	0.325	0.362	0.399	0.435	0.470	0.488	0.573
28			0.354	0.376	0.420	0.462	0.504	0.546	0.566	0.665
30			0.407	0.432	0.482	0.531	0.579	0.626	0.650	0.763
32			0.463	0.492	0.548	0.604	0.659	0.713	0.739	0.869
34			0.523	0.555	0.619	0.682	0.744	0.804	0.834	0.980
36			0.586	0.622	0.694	0.764	0.834	0.902	0.935	1.099
38			0.653	0.693	0.773	0.852	0.929	1.005	1.042	1.225
40			0.723	0.768	0.857	0.944	1.029	1.113	1.155	1.357
42			0.798	0.847	0.945	1.040	1.135	1.227	1.273	1.496
44			0.875	0.930	1.037	1.142	1.245	1.347	1.397	1.642
46			0.957	1.016	1.133	1.248	1.361	1.472	1.527	1.795
48			1.042	1.106	1.234	1.359	1.482	1.603	1.663	1.954
50				1.200	1.339	1.475	1.608	1.740	1.804	2.120
52				1.298	1.448	1.595	1.739	1.881	1.952	2.293
54				1.400	1.561	1.720	1.876	2.029	2.105	2.473
56				1.506	1.679	1.850	2.017	2.182	2.263	2.660
58						1.984	2.164	2.341	2.428	2.853
60						2.123	2.316	2.505	2.598	3.053
62						2.267	2.473	2.675	2.774	3.260
64						2.416	2.635	2.850	2.956	3.474
66							2.802	3.031	3.144	3.695
68							2.975	3.217	3.337	3.922
70							3.152	3.409	3.537	4.156
72							3.335	3.607	3.742	4.397
74							3.523	3.810	3.952	4.645

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 0.634 ; C2 = 440.496

DATA SOURCE: 62 TREES FROM ONT.
ACCURACY: + OR - 28.1 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

IRONWOOD / OSTRYA VIRGINIANA (MILL.) K. KOCH

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.008						
6	0.007	0.013	0.018	0.019	0.021	0.022				
8	0.013	0.023	0.032	0.034	0.037	0.040				
10	0.020	0.036	0.050	0.053	0.058	0.062	0.067	0.071		
12	0.028	0.052	0.072	0.076	0.083	0.090	0.096	0.102		
14	0.038	0.071	0.098	0.103	0.113	0.122	0.131	0.139	0.143	0.162
16	0.050	0.092	0.128	0.135	0.148	0.160	0.171	0.182	0.187	0.211
18		0.117	0.163	0.171	0.187	0.202	0.217	0.230	0.237	0.267
20		0.144	0.201	0.211	0.231	0.250	0.267	0.284	0.292	0.330
22		0.175	0.243	0.255	0.279	0.302	0.323	0.344	0.354	0.399
24		0.208	0.289	0.304	0.332	0.359	0.385	0.409	0.421	0.475
26			0.339	0.357	0.390	0.422	0.452	0.480	0.494	0.557
28			0.393	0.414	0.452	0.489	0.524	0.557	0.573	0.646
30			0.452	0.475	0.519	0.562	0.601	0.639	0.658	0.742
32			0.514	0.540	0.591	0.639	0.684	0.727	0.748	0.844
34			0.580	0.610	0.667	0.721	0.773	0.821	0.845	0.953
36			0.650	0.684	0.748	0.809	0.866	0.921	0.947	1.069
38			0.725	0.762	0.833	0.901	0.965	1.026	1.055	1.191
40			0.803	0.844	0.923	0.998	1.069	1.137	1.169	1.319
42			0.885	0.931	1.018	1.101	1.179	1.253	1.289	1.454
44			0.972	1.022	1.117	1.208	1.294	1.375	1.414	1.596
46			1.062	1.117	1.221	1.320	1.414	1.503	1.546	1.745
48			1.156	1.216	1.330	1.438	1.540	1.637	1.683	1.900
50				1.319	1.443	1.560	1.671	1.776	1.826	2.061
52				1.427	1.561	1.687	1.807	1.921	1.975	2.229
54				1.539	1.683	1.819	1.949	2.071	2.130	2.404
56				1.655	1.810	1.957	2.096	2.228	2.291	2.586
58						2.099	2.248	2.390	2.458	2.774
60						2.246	2.406	2.557	2.630	2.968
62						2.398	2.569	2.731	2.808	3.169
64						2.556	2.737	2.910	2.992	3.377
66							2.911	3.094	3.182	3.592
68							3.090	3.285	3.378	3.813
70							3.275	3.481	3.580	4.040
72							3.464	3.682	3.787	4.274
74							3.660	3.890	4.001	4.515

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 1.877 ; C2 = 332.585

DATA SOURCE: 147 TREES FROM ONT.
ACCURACY: + OR - 23.6 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)

(STUMP AND TOP INCLUDED)

RED OAK / QUERCUS RUBRA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002						
4	0.003	0.006	0.008	0.009						
6	0.007	0.013	0.019	0.020	0.022	0.023				
8	0.013	0.024	0.033	0.035	0.038	0.042				
10	0.020	0.037	0.052	0.055	0.060	0.065	0.070	0.075		
12	0.028	0.053	0.075	0.079	0.087	0.094	0.101	0.108		
14	0.039	0.072	0.102	0.107	0.118	0.128	0.138	0.147	0.151	0.172
16	0.050	0.094	0.133	0.140	0.154	0.167	0.180	0.192	0.198	0.225
18		0.119	0.168	0.177	0.195	0.211	0.227	0.243	0.250	0.285
20		0.147	0.208	0.219	0.240	0.261	0.281	0.300	0.309	0.352
22		0.178	0.251	0.265	0.291	0.316	0.340	0.363	0.374	0.425
24		0.212	0.299	0.315	0.346	0.376	0.404	0.431	0.445	0.506
26			0.351	0.370	0.406	0.441	0.474	0.506	0.522	0.594
28			0.407	0.429	0.471	0.512	0.550	0.587	0.605	0.689
30			0.467	0.492	0.541	0.587	0.632	0.674	0.695	0.791
32			0.531	0.560	0.615	0.668	0.719	0.767	0.790	0.900
34			0.600	0.632	0.695	0.754	0.811	0.866	0.892	1.016
36			0.673	0.709	0.779	0.846	0.910	0.971	1.000	1.139
38			0.749	0.790	0.868	0.942	1.014	1.082	1.115	1.269
40			0.830	0.875	0.962	1.044	1.123	1.198	1.235	1.406
42			0.916	0.965	1.060	1.151	1.238	1.321	1.362	1.550
44			1.005	1.059	1.164	1.263	1.359	1.450	1.494	1.702
46			1.098	1.157	1.272	1.381	1.485	1.585	1.633	1.860
48			1.196	1.260	1.385	1.504	1.617	1.726	1.778	2.025
50				1.368	1.503	1.632	1.755	1.873	1.930	2.197
52				1.479	1.625	1.765	1.898	2.025	2.087	2.377
54				1.595	1.753	1.903	2.047	2.184	2.251	2.563
56				1.715	1.885	2.047	2.201	2.349	2.421	2.756
58						2.195	2.361	2.520	2.597	2.957
60						2.349	2.527	2.697	2.779	3.164
62						2.509	2.698	2.879	2.967	3.378
64						2.673	2.875	3.068	3.161	3.600
66							3.058	3.263	3.362	3.828
68							3.246	3.464	3.569	4.064
70							3.439	3.670	3.782	4.307
72							3.639	3.883	4.001	4.556
74							3.844	4.102	4.227	4.813

EQUATION: V = (0.0043691*D*D*(1 - 0.04365*B2)**2)/(C1 + 0.3048*C2/H)
WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145 ; C1 = 1.512 ; C2 = 336.509

DATA SOURCE: 40 TREES FROM ONT.
ACCURACY: + OR - 13.8 PERCENT AT 95% CONFIDENCE LEVEL

APPENDIX II Merchantable Cubic Metre Volume Tables

SPECIES	PAGE
Eastern white pine (Pinus strobus L.)	46
Red pine (Pinus resinosa Ait.)	47
Jack pine (Pinus banksiana Lamb.)	48
Lodgepole pine (Pinus contorta Dougl. var. latifolia Engelm.)	49
Black spruce (Picea mariana (Mill.) B.S.P.)	50
Red spruce (Picea rubens Sarg.)	51
White spruce (Picea glauca (Moench) Voss.)	52
Balsam fir (Abies balsamea (L.) (Mill.))	53
Eastern white cedar (Thuja occidentalis L.)	54
Eastern hemlock (Tsuga canadensis (L.) Carr.)	55
Trembling aspen (Populus tremuloides Michx.)	56
Balsam poplar (Populus balsamifera L.)	57
White birch (Betula papyrifera Marsh.)	58
Yellow birch (Betula alleghaniensis Britt.)	59
Maple (Acer L.)	60
Basswood (Tilia americana L.)	61
Beech (Fagus grandifolia Ehrh.)	62
Black cherry (Prunus serotina Ehrh.)	63
White elm (Ulmus americana L.)	64
Ironwood (Ostrya virginiana (Mill.) K. Koch)	65
Red oak (Quercus rubra L.)	66

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.012	0.024	0.036	0.038	0.042	0.046	0.051	0.055		
12	0.022	0.042	0.062	0.065	0.073	0.080	0.087	0.094		
14	0.032	0.062	0.091	0.096	0.107	0.117	0.128	0.138	0.143	0.167
16	0.043	0.084	0.123	0.130	0.145	0.159	0.174	0.187	0.194	0.227
18		0.109	0.159	0.169	0.188	0.206	0.225	0.242	0.251	0.293
20		0.137	0.199	0.211	0.235	0.258	0.281	0.303	0.314	0.367
22		0.167	0.243	0.258	0.287	0.316	0.343	0.371	0.384	0.449
24		0.200	0.292	0.309	0.344	0.378	0.411	0.444	0.460	0.537
26			0.344	0.365	0.406	0.446	0.485	0.523	0.542	0.634
28			0.400	0.425	0.472	0.519	0.565	0.609	0.631	0.738
30			0.461	0.489	0.544	0.597	0.650	0.701	0.727	0.849
32			0.525	0.557	0.620	0.681	0.741	0.800	0.829	0.968
34			0.594	0.630	0.701	0.770	0.838	0.904	0.937	1.095
36			0.667	0.708	0.787	0.865	0.941	1.015	1.052	1.229
38			0.744	0.789	0.878	0.965	1.050	1.133	1.174	1.371
40			0.826	0.876	0.974	1.070	1.164	1.256	1.302	1.521
42			0.911	0.966	1.075	1.181	1.285	1.386	1.436	1.678
44			1.000	1.061	1.180	1.297	1.411	1.523	1.578	1.843
46			1.094	1.160	1.291	1.418	1.543	1.665	1.725	2.016
48			1.192	1.264	1.406	1.545	1.681	1.814	1.880	2.196
50				1.372	1.527	1.678	1.825	1.969	2.040	2.384
52				1.485	1.652	1.815	1.975	2.131	2.208	2.580
54				1.602	1.782	1.958	2.130	2.299	2.382	2.783
56				1.724	1.917	2.107	2.292	2.473	2.562	2.994
58						2.260	2.459	2.654	2.749	3.213
60						2.420	2.632	2.841	2.943	3.439
62						2.584	2.812	3.034	3.143	3.673
64						2.754	2.996	3.233	3.350	3.914
66							3.187	3.439	3.563	4.164
68							3.384	3.652	3.783	4.421
70							3.587	3.870	4.010	4.685
72							3.795	4.095	4.243	4.958
74							4.009	4.326	4.482	5.237

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9735 ; R2 = -0.2348 ; R3 = -0.7378

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.184 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1169 TREES FROM N.B., QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

RED PINE / PINUS RESINOSA AIT.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.026	0.037	0.040	0.044	0.048	0.053	0.057		
12	0.023	0.045	0.065	0.069	0.077	0.084	0.091	0.099		
14	0.034	0.065	0.095	0.101	0.112	0.123	0.134	0.144	0.150	0.175
16	0.045	0.088	0.128	0.136	0.151	0.166	0.181	0.195	0.202	0.236
18		0.114	0.165	0.175	0.195	0.214	0.233	0.251	0.260	0.304
20		0.142	0.206	0.219	0.243	0.267	0.291	0.314	0.325	0.379
22		0.173	0.251	0.267	0.296	0.326	0.354	0.382	0.396	0.462
24		0.206	0.300	0.319	0.354	0.389	0.423	0.456	0.473	0.552
26			0.354	0.375	0.417	0.458	0.498	0.537	0.556	0.649
28			0.411	0.436	0.484	0.532	0.579	0.624	0.646	0.754
30			0.472	0.501	0.557	0.612	0.665	0.717	0.743	0.867
32			0.538	0.571	0.634	0.697	0.758	0.817	0.846	0.988
34			0.608	0.645	0.717	0.787	0.856	0.923	0.956	1.116
36			0.682	0.723	0.804	0.883	0.960	1.036	1.073	1.252
38			0.760	0.806	0.896	0.984	1.070	1.154	1.196	1.396
40			0.843	0.893	0.993	1.091	1.186	1.280	1.325	1.547
42			0.929	0.985	1.096	1.203	1.308	1.411	1.462	1.706
44			1.020	1.082	1.203	1.321	1.436	1.549	1.605	1.873
46			1.115	1.183	1.315	1.444	1.570	1.693	1.754	2.047
48			1.215	1.288	1.432	1.572	1.710	1.844	1.910	2.230
50				1.398	1.554	1.706	1.856	2.001	2.073	2.420
52				1.512	1.681	1.846	2.007	2.165	2.243	2.617
54				1.631	1.813	1.991	2.165	2.335	2.419	2.823
56				1.754	1.950	2.141	2.328	2.511	2.601	3.036
58						2.297	2.498	2.694	2.791	3.257
60						2.459	2.673	2.883	2.987	3.486
62						2.625	2.855	3.079	3.189	3.722
64						2.798	3.042	3.281	3.399	3.967
66							3.235	3.490	3.614	4.219
68							3.435	3.704	3.837	4.478
70							3.640	3.926	4.066	4.746
72							3.851	4.153	4.302	5.021
74							4.068	4.387	4.544	5.304

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9672 ; R2 = -0.0393 ; R3 = -1.0523

X3 = (T*T/(C*C*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.151 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1333 TREES FROM N.B.,QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

JACK PINE / PINUS BANKSIANA LAMB.

CBHCE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.026	0.037	0.039	0.044	0.048	0.052	0.056		
12	0.023	0.044	0.064	0.067	0.075	0.082	0.089	0.095		
14	0.033	0.064	0.093	0.098	0.109	0.119	0.129	0.139	0.144	0.167
16	0.045	0.087	0.126	0.133	0.147	0.161	0.175	0.188	0.195	0.226
18		0.112	0.162	0.171	0.190	0.208	0.226	0.243	0.251	0.291
20		0.140	0.202	0.214	0.238	0.260	0.282	0.303	0.314	0.364
22		0.171	0.247	0.261	0.290	0.317	0.344	0.370	0.383	0.444
24		0.204	0.295	0.313	0.347	0.379	0.412	0.443	0.458	0.531
26			0.348	0.368	0.408	0.447	0.485	0.521	0.539	0.625
28			0.405	0.428	0.475	0.520	0.564	0.606	0.627	0.727
30			0.465	0.493	0.546	0.598	0.649	0.698	0.722	0.837
32			0.530	0.562	0.623	0.682	0.739	0.795	0.822	0.954
34			0.600	0.635	0.704	0.771	0.836	0.899	0.930	1.078
36			0.673	0.712	0.790	0.865	0.938	1.009	1.043	1.210
38			0.750	0.794	0.881	0.964	1.046	1.125	1.164	1.349
40			0.832	0.881	0.977	1.069	1.160	1.247	1.290	1.496
42			0.918	0.972	1.077	1.180	1.279	1.376	1.423	1.650
44			1.008	1.067	1.183	1.295	1.405	1.511	1.563	1.812
46			1.102	1.167	1.293	1.416	1.536	1.652	1.709	1.982
48			1.201	1.271	1.409	1.543	1.673	1.799	1.861	2.158
50				1.380	1.529	1.675	1.816	1.953	2.020	2.343
52				1.493	1.655	1.812	1.965	2.113	2.186	2.535
54				1.610	1.785	1.954	2.119	2.279	2.358	2.734
56				1.732	1.920	2.102	2.280	2.452	2.536	2.941
58						2.256	2.446	2.631	2.721	3.155
60						2.414	2.618	2.816	2.913	3.377
62						2.578	2.796	3.007	3.111	3.607
64						2.748	2.979	3.205	3.315	3.844
66							3.169	3.408	3.526	4.088
68							3.364	3.619	3.743	4.340
70							3.565	3.835	3.967	4.600
72							3.773	4.058	4.197	4.867
74							3.985	4.287	4.434	5.142

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9635 ; R2 = -0.1500 ; R3 = -0.8081

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.151 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 6166 TREES FROM QUE., ONT., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.014	0.027	0.040	0.042	0.047	0.051	0.056	0.060		
12	0.024	0.046	0.067	0.071	0.079	0.087	0.094	0.102		
14	0.035	0.067	0.098	0.103	0.115	0.126	0.137	0.148	0.153	0.179
16	0.047	0.090	0.132	0.140	0.155	0.171	0.185	0.200	0.207	0.242
18		0.117	0.170	0.180	0.200	0.220	0.239	0.258	0.267	0.312
20		0.146	0.212	0.225	0.250	0.274	0.298	0.322	0.333	0.389
22		0.178	0.258	0.274	0.305	0.334	0.364	0.392	0.406	0.474
24		0.212	0.309	0.328	0.364	0.400	0.435	0.469	0.486	0.567
26			0.364	0.386	0.429	0.471	0.512	0.552	0.572	0.668
28			0.423	0.449	0.499	0.548	0.595	0.642	0.665	0.776
30			0.487	0.516	0.574	0.630	0.685	0.739	0.765	0.893
32			0.555	0.588	0.654	0.718	0.780	0.842	0.872	1.017
34			0.627	0.665	0.739	0.811	0.882	0.951	0.985	1.150
36			0.703	0.746	0.829	0.910	0.990	1.067	1.106	1.290
38			0.784	0.831	0.924	1.015	1.104	1.190	1.233	1.439
40			0.869	0.922	1.025	1.125	1.224	1.320	1.367	1.595
42			0.959	1.017	1.131	1.241	1.350	1.456	1.508	1.759
44			1.053	1.117	1.241	1.363	1.482	1.598	1.656	1.932
46			1.151	1.221	1.357	1.490	1.621	1.748	1.810	2.112
48			1.254	1.330	1.478	1.623	1.765	1.904	1.972	2.301
50				1.443	1.605	1.762	1.916	2.066	2.140	2.497
52				1.562	1.736	1.906	2.073	2.235	2.315	2.701
54				1.684	1.872	2.056	2.236	2.411	2.497	2.914
56				1.812	2.014	2.212	2.405	2.593	2.686	3.134
58						2.373	2.580	2.782	2.882	3.363
60						2.540	2.761	2.978	3.085	3.599
62						2.712	2.949	3.180	3.294	3.844
64						2.890	3.143	3.389	3.510	4.096
66							3.343	3.605	3.734	4.357
68							3.549	3.827	3.964	4.625
70							3.761	4.056	4.201	4.902
72							3.979	4.291	4.445	5.186
74							4.204	4.533	4.695	5.479

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9658 ; R2 = -0.1278 ; R3 = -0.8108

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.118 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 850 TREES FROM ALTA.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.014	0.025	0.036	0.038	0.042	0.045	0.049	0.052		
12	0.023	0.043	0.061	0.064	0.070	0.076	0.082	0.088		
14	0.034	0.063	0.088	0.093	0.102	0.111	0.119	0.127	0.131	0.149
16	0.045	0.085	0.115	0.126	0.138	0.150	0.161	0.171	0.177	0.201
18		0.109	0.154	0.162	0.178	0.193	0.207	0.221	0.227	0.258
20		0.136	0.192	0.202	0.222	0.241	0.258	0.276	0.284	0.322
22		0.166	0.234	0.246	0.270	0.293	0.315	0.336	0.346	0.393
24		0.199	0.279	0.294	0.323	0.350	0.376	0.401	0.413	0.470
26			0.329	0.346	0.380	0.412	0.443	0.472	0.487	0.553
28			0.382	0.403	0.442	0.480	0.515	0.549	0.566	0.643
30			0.440	0.463	0.508	0.551	0.592	0.632	0.651	0.739
32			0.501	0.528	0.579	0.628	0.675	0.720	0.741	0.842
34			0.566	0.596	0.655	0.710	0.763	0.813	0.838	0.952
36			0.635	0.669	0.734	0.797	0.856	0.912	0.940	1.068
38			0.708	0.746	0.819	0.888	0.954	1.017	1.048	1.191
40			0.785	0.827	0.908	0.985	1.058	1.128	1.162	1.320
42			0.866	0.912	1.001	1.086	1.167	1.244	1.281	1.456
44			0.951	1.002	1.099	1.193	1.281	1.366	1.407	1.598
46			1.040	1.095	1.202	1.304	1.401	1.493	1.538	1.748
48			1.132	1.193	1.309	1.420	1.526	1.627	1.675	1.903
50				1.295	1.421	1.541	1.656	1.765	1.818	2.066
52				1.401	1.537	1.667	1.791	1.910	1.967	2.235
54				1.511	1.658	1.798	1.932	2.060	2.122	2.411
56				1.625	1.783	1.934	2.078	2.216	2.282	2.593
58						2.075	2.230	2.377	2.448	2.782
60						2.221	2.387	2.544	2.621	2.977
62						2.372	2.549	2.717	2.798	3.180
64						2.529	2.716	2.896	2.982	3.388
66							2.889	3.080	3.172	3.604
68							3.067	3.269	3.367	3.826
70							3.250	3.465	3.569	4.054
72							3.439	3.666	3.776	4.290
74							3.632	3.873	3.989	4.532

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9526 ; R2 = -0.1037 ; R3 = -0.8199

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.164 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 7442 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

RED SPRUCE / PICEA RUBENS SARG.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.015	0.029	0.041	0.043	0.047	0.052	0.056	0.060		
12	0.025	0.048	0.068	0.072	0.079	0.086	0.093	0.100		
14	0.037	0.069	0.099	0.104	0.115	0.125	0.135	0.144	0.148	0.170
16	0.049	0.093	0.133	0.140	0.154	0.168	0.181	0.194	0.200	0.229
18		0.120	0.171	0.180	0.198	0.216	0.233	0.249	0.257	0.294
20		0.150	0.213	0.224	0.247	0.269	0.290	0.310	0.320	0.367
22		0.182	0.259	0.273	0.301	0.328	0.353	0.378	0.390	0.446
24		0.218	0.310	0.327	0.360	0.392	0.422	0.452	0.466	0.534
26			0.364	0.385	0.424	0.461	0.497	0.532	0.549	0.628
28			0.424	0.447	0.492	0.536	0.578	0.618	0.638	0.730
30			0.487	0.514	0.566	0.616	0.665	0.711	0.733	0.839
32			0.555	0.586	0.645	0.702	0.757	0.810	0.835	0.956
34			0.627	0.662	0.729	0.794	0.856	0.915	0.944	1.081
36			0.703	0.742	0.818	0.890	0.960	1.027	1.059	1.212
38			0.784	0.828	0.912	0.993	1.070	1.145	1.181	1.352
40			0.869	0.918	1.011	1.101	1.186	1.269	1.309	1.499
42			0.959	1.012	1.115	1.214	1.309	1.400	1.444	1.653
44			1.053	1.111	1.224	1.333	1.437	1.537	1.585	1.815
46			1.151	1.215	1.339	1.457	1.571	1.680	1.733	1.984
48			1.254	1.323	1.458	1.587	1.711	1.830	1.888	2.161
50				1.436	1.582	1.722	1.857	1.986	2.049	2.345
52				1.554	1.712	1.863	2.009	2.149	2.217	2.537
54				1.676	1.846	2.010	2.167	2.318	2.391	2.737
56				1.803	1.986	2.162	2.331	2.493	2.572	2.944
58						2.319	2.500	2.674	2.759	3.158
60						2.482	2.676	2.862	2.953	3.380
62						2.651	2.858	3.057	3.153	3.610
64						2.825	3.045	3.257	3.360	3.847
66							3.239	3.464	3.574	4.091
68							3.439	3.678	3.794	4.343
70							3.644	3.898	4.021	4.603
72							3.855	4.124	4.254	4.870
74							4.073	4.357	4.494	5.145

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9644 ; R2 = -0.0995 ; R3 = -0.7658

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.169 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 227 TREES FROM N.B.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.034	0.036	0.040	0.043	0.047	0.050		
12	0.022	0.041	0.059	0.062	0.068	0.074	0.080	0.085		
14	0.032	0.061	0.086	0.091	0.100	0.109	0.117	0.125	0.129	0.147
16	0.044	0.083	0.117	0.123	0.136	0.147	0.159	0.170	0.175	0.200
18		0.107	0.151	0.160	0.176	0.191	0.205	0.219	0.226	0.258
20		0.134	0.189	0.200	0.220	0.239	0.257	0.275	0.283	0.323
22		0.164	0.231	0.244	0.268	0.292	0.314	0.336	0.346	0.395
24		0.196	0.277	0.292	0.322	0.350	0.376	0.402	0.415	0.473
26			0.327	0.345	0.379	0.412	0.444	0.474	0.489	0.558
28			0.381	0.401	0.441	0.480	0.517	0.552	0.569	0.650
30			0.438	0.462	0.508	0.553	0.595	0.636	0.655	0.748
32			0.500	0.527	0.580	0.630	0.678	0.725	0.747	0.853
34			0.565	0.596	0.656	0.713	0.767	0.820	0.845	0.965
36			0.634	0.669	0.736	0.800	0.861	0.920	0.949	1.083
38			0.708	0.746	0.821	0.893	0.961	1.027	1.058	1.208
40			0.785	0.828	0.911	0.990	1.066	1.139	1.174	1.340
42			0.866	0.913	1.005	1.092	1.176	1.257	1.295	1.479
44			0.951	1.003	1.104	1.200	1.292	1.380	1.423	1.624
46			1.040	1.097	1.207	1.312	1.413	1.509	1.556	1.776
48			1.134	1.195	1.315	1.430	1.539	1.644	1.695	1.935
50				1.298	1.428	1.552	1.671	1.785	1.840	2.101
52				1.404	1.545	1.679	1.808	1.932	1.992	2.273
54				1.515	1.667	1.812	1.951	2.084	2.148	2.452
56				1.630	1.793	1.949	2.099	2.242	2.311	2.638
58						2.091	2.252	2.406	2.480	2.831
60						2.239	2.410	2.575	2.655	3.030
62						2.391	2.574	2.750	2.835	3.236
64						2.548	2.744	2.931	3.022	3.449
66							2.919	3.118	3.214	3.669
68							3.099	3.310	3.413	3.896
70							3.284	3.509	3.617	4.129
72							3.475	3.712	3.827	4.369
74							3.671	3.922	4.044	4.615

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9611 ; R2 = -0.2456 ; R3 = -0.6801

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.176 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 2692 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.015	0.027	0.037	0.039	0.043	0.046	0.049	0.052		
12	0.025	0.045	0.062	0.065	0.071	0.076	0.081	0.086		
14	0.036	0.065	0.090	0.094	0.102	0.110	0.117	0.124	0.127	0.142
16	0.048	0.088	0.120	0.126	0.137	0.148	0.157	0.166	0.171	0.191
18		0.113	0.154	0.162	0.176	0.190	0.202	0.214	0.219	0.245
20		0.140	0.192	0.202	0.219	0.236	0.252	0.266	0.273	0.305
22		0.171	0.234	0.245	0.267	0.287	0.306	0.324	0.332	0.372
24		0.204	0.279	0.293	0.319	0.343	0.365	0.387	0.397	0.444
26			0.329	0.344	0.375	0.403	0.430	0.455	0.467	0.522
28			0.382	0.400	0.435	0.468	0.499	0.529	0.543	0.606
30			0.439	0.460	0.501	0.538	0.574	0.608	0.624	0.697
32			0.500	0.524	0.570	0.613	0.654	0.692	0.710	0.794
34			0.564	0.592	0.644	0.693	0.739	0.782	0.802	0.897
36			0.633	0.664	0.722	0.777	0.828	0.877	0.900	1.006
38			0.706	0.740	0.805	0.866	0.923	0.977	1.003	1.121
40			0.782	0.820	0.892	0.960	1.024	1.083	1.112	1.243
42			0.862	0.904	0.984	1.059	1.129	1.195	1.226	1.370
44			0.947	0.993	1.080	1.162	1.239	1.311	1.346	1.504
46			1.035	1.085	1.181	1.270	1.355	1.434	1.471	1.645
48			1.127	1.182	1.286	1.384	1.475	1.561	1.602	1.791
50				1.283	1.396	1.501	1.601	1.694	1.739	1.944
52				1.387	1.510	1.624	1.732	1.833	1.881	2.102
54				1.496	1.628	1.752	1.868	1.977	2.029	2.268
56				1.609	1.751	1.884	2.009	2.126	2.182	2.439
58						2.021	2.155	2.281	2.341	2.616
60						2.163	2.306	2.441	2.505	2.800
62						2.310	2.463	2.606	2.675	2.990
64						2.461	2.624	2.777	2.850	3.186
66							2.791	2.954	3.032	3.389
68							2.963	3.136	3.218	3.597
70							3.140	3.323	3.410	3.812
72							3.322	3.516	3.608	4.033
74							3.509	3.714	3.812	4.260

EQUATION: VM=V*(B1 + B2*X3 + B3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9352 ; B2 = -0.0395 ; B3 = -0.8147

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.152 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 2768 TREES FROM NFLD.,N.B., QUE., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

EASTERN WHITE CEDAR / THUJA OCCIDENTALIS L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.015	0.025	0.032	0.034	0.036	0.038	0.039	0.041		
12	0.026	0.043	0.055	0.057	0.061	0.064	0.067	0.070		
14	0.039	0.064	0.081	0.084	0.089	0.094	0.098	0.102	0.103	0.111
16	0.052	0.086	0.109	0.113	0.120	0.127	0.132	0.137	0.140	0.150
18		0.111	0.141	0.146	0.155	0.163	0.171	0.177	0.181	0.194
20		0.139	0.176	0.183	0.194	0.204	0.213	0.222	0.226	0.243
22		0.169	0.215	0.223	0.237	0.249	0.260	0.271	0.275	0.296
24		0.202	0.258	0.267	0.283	0.298	0.312	0.324	0.329	0.354
26			0.304	0.314	0.334	0.351	0.367	0.381	0.388	0.417
28			0.353	0.365	0.388	0.409	0.427	0.444	0.451	0.485
30			0.406	0.420	0.447	0.470	0.491	0.510	0.519	0.558
32			0.463	0.479	0.509	0.536	0.560	0.582	0.592	0.636
34			0.523	0.542	0.576	0.606	0.633	0.658	0.669	0.719
36			0.587	0.608	0.646	0.680	0.710	0.738	0.751	0.807
38			0.655	0.678	0.720	0.758	0.792	0.823	0.837	0.900
40			0.726	0.752	0.799	0.841	0.879	0.913	0.929	0.998
42			0.801	0.830	0.881	0.928	0.969	1.007	1.024	1.101
44			0.880	0.911	0.968	1.019	1.064	1.106	1.125	1.209
46			0.962	0.996	1.058	1.114	1.164	1.209	1.230	1.322
48			1.048	1.085	1.153	1.213	1.268	1.317	1.340	1.440
50				1.178	1.251	1.317	1.376	1.429	1.454	1.563
52				1.274	1.354	1.425	1.489	1.546	1.573	1.691
54				1.374	1.460	1.537	1.606	1.668	1.697	1.824
56				1.478	1.571	1.653	1.727	1.794	1.826	1.962
58						1.774	1.853	1.925	1.959	2.105
60						1.898	1.984	2.061	2.097	2.253
62						2.028	2.119	2.201	2.239	2.407
64						2.161	2.258	2.345	2.386	2.565
66							2.401	2.495	2.538	2.728
68							2.549	2.648	2.695	2.896
70							2.702	2.807	2.856	3.069
72							2.859	2.970	3.022	3.247
74							3.020	3.137	3.192	3.431

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9645 ; R2 = -0.1616 ; R3 = -0.7945

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.155 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 187 TREES FROM QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

EASTERN HEMLOCK / TSUGA CANADENSIS (L.) CARR.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.025	0.036	0.038	0.042	0.046	0.050	0.053		
12	0.022	0.043	0.062	0.065	0.072	0.079	0.085	0.091		
14	0.033	0.063	0.090	0.095	0.105	0.115	0.124	0.133	0.137	0.158
16	0.044	0.085	0.122	0.129	0.142	0.155	0.168	0.180	0.186	0.214
18		0.110	0.157	0.166	0.183	0.200	0.217	0.232	0.240	0.277
20		0.137	0.196	0.207	0.229	0.250	0.271	0.290	0.300	0.346
22		0.167	0.239	0.253	0.280	0.305	0.330	0.354	0.366	0.422
24		0.200	0.286	0.303	0.335	0.365	0.395	0.424	0.438	0.505
26			0.337	0.357	0.394	0.430	0.465	0.499	0.516	0.594
28			0.392	0.415	0.459	0.501	0.541	0.581	0.600	0.691
30			0.451	0.477	0.528	0.576	0.623	0.668	0.690	0.795
32			0.515	0.544	0.601	0.657	0.710	0.762	0.787	0.907
34			0.582	0.615	0.680	0.742	0.803	0.861	0.889	1.025
36			0.653	0.690	0.763	0.833	0.901	0.966	0.998	1.150
38			0.728	0.770	0.851	0.929	1.005	1.078	1.113	1.283
40			0.807	0.854	0.943	1.030	1.114	1.195	1.234	1.423
42			0.891	0.942	1.041	1.136	1.229	1.318	1.362	1.569
44			0.978	1.034	1.143	1.248	1.349	1.448	1.495	1.723
46			1.070	1.131	1.250	1.365	1.476	1.583	1.635	1.884
48			1.165	1.232	1.361	1.486	1.607	1.724	1.781	2.053
50				1.337	1.478	1.613	1.745	1.871	1.933	2.228
52				1.446	1.599	1.746	1.888	2.025	2.092	2.410
54				1.560	1.724	1.883	2.036	2.184	2.256	2.600
56				1.678	1.855	2.025	2.190	2.349	2.427	2.797
58						2.173	2.350	2.521	2.604	3.001
60						2.326	2.515	2.698	2.787	3.212
62						2.484	2.686	2.882	2.977	3.430
64						2.647	2.863	3.071	3.172	3.656
66							3.045	3.266	3.374	3.888
68							3.233	3.468	3.582	4.128
70							3.426	3.675	3.797	4.375
72							3.625	3.888	4.017	4.629
74							3.829	4.108	4.244	4.890

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9645 ; R2 = -0.1616 ; R3 = -0.7945

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.155 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 383 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

TREMBLING ASPEN / POPULUS TREMULOIDES MICHX.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.011	0.023	0.035	0.038	0.042	0.047	0.053	0.058		
12	0.020	0.040	0.060	0.065	0.073	0.082	0.090	0.099		
14	0.029	0.058	0.088	0.094	0.106	0.119	0.131	0.144	0.150	0.182
16	0.038	0.078	0.118	0.126	0.143	0.159	0.176	0.193	0.202	0.245
18		0.100	0.152	0.162	0.183	0.205	0.226	0.248	0.259	0.315
20		0.124	0.188	0.201	0.228	0.254	0.281	0.308	0.322	0.391
22		0.151	0.229	0.245	0.277	0.309	0.342	0.374	0.391	0.475
24		0.180	0.273	0.292	0.330	0.369	0.407	0.447	0.466	0.567
26			0.321	0.343	0.388	0.433	0.479	0.525	0.548	0.666
28			0.372	0.398	0.450	0.503	0.556	0.609	0.636	0.773
30			0.428	0.457	0.517	0.577	0.638	0.699	0.730	0.888
32			0.487	0.520	0.588	0.657	0.726	0.796	0.831	1.010
34			0.549	0.587	0.664	0.742	0.820	0.899	0.938	1.140
36			0.616	0.659	0.745	0.831	0.919	1.007	1.052	1.278
38			0.686	0.734	0.829	0.926	1.024	1.122	1.172	1.424
40			0.760	0.813	0.919	1.026	1.134	1.244	1.299	1.578
42			0.838	0.896	1.013	1.131	1.251	1.371	1.432	1.740
44			0.920	0.984	1.112	1.241	1.372	1.505	1.571	1.909
46			1.005	1.075	1.215	1.357	1.500	1.644	1.717	2.086
48			1.094	1.170	1.323	1.477	1.633	1.790	1.869	2.272
50				1.270	1.435	1.603	1.772	1.942	2.028	2.465
52				1.373	1.552	1.733	1.916	2.101	2.194	2.666
54				1.481	1.674	1.869	2.066	2.265	2.365	2.874
56				1.592	1.800	2.010	2.222	2.436	2.544	3.091
58						2.156	2.383	2.613	2.729	3.315
60						2.307	2.550	2.796	2.920	3.548
62						2.463	2.723	2.985	3.117	3.788
64						2.625	2.901	3.181	3.322	4.036
66							3.085	3.383	3.532	4.292
68							3.275	3.590	3.749	4.556
70							3.470	3.805	3.973	4.828
72							3.671	4.025	4.203	5.107
74							3.878	4.252	4.440	5.395

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9354 ; R2 = 0.0957 ; R3 = -1.1613

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.127 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 800 TREES FROM QUE., ONT., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BALSAM POPLAR / POPULUS BALSAMIFERA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.012	0.024	0.036	0.038	0.042	0.047	0.051	0.055		
12	0.021	0.042	0.061	0.065	0.073	0.081	0.088	0.095		
14	0.031	0.060	0.089	0.095	0.106	0.117	0.128	0.139	0.144	0.170
16	0.041	0.081	0.120	0.127	0.142	0.157	0.172	0.186	0.193	0.228
18		0.104	0.154	0.163	0.183	0.202	0.220	0.239	0.248	0.293
20		0.130	0.191	0.203	0.227	0.251	0.274	0.297	0.308	0.364
22		0.157	0.232	0.247	0.276	0.305	0.333	0.361	0.375	0.442
24		0.188	0.277	0.294	0.329	0.363	0.397	0.430	0.447	0.528
26			0.325	0.346	0.387	0.427	0.467	0.506	0.525	0.620
28			0.378	0.402	0.449	0.495	0.541	0.587	0.609	0.720
30			0.434	0.461	0.515	0.569	0.622	0.674	0.700	0.826
32			0.494	0.525	0.587	0.647	0.708	0.767	0.796	0.941
34			0.557	0.593	0.662	0.731	0.799	0.866	0.899	1.062
36			0.625	0.664	0.742	0.820	0.896	0.971	1.008	1.190
38			0.696	0.740	0.827	0.913	0.998	1.082	1.123	1.326
40			0.771	0.820	0.916	1.012	1.106	1.198	1.244	1.469
42			0.850	0.904	1.010	1.115	1.219	1.321	1.372	1.620
44			0.933	0.992	1.109	1.224	1.338	1.450	1.505	1.778
46			1.020	1.084	1.212	1.338	1.462	1.584	1.645	1.943
48			1.110	1.180	1.319	1.456	1.591	1.725	1.791	2.115
50				1.281	1.431	1.580	1.727	1.872	1.943	2.295
52				1.385	1.548	1.709	1.867	2.024	2.102	2.482
54				1.494	1.669	1.843	2.014	2.183	2.266	2.677
56				1.606	1.795	1.981	2.165	2.347	2.437	2.878
58						2.125	2.323	2.518	2.614	3.087
60						2.274	2.486	2.694	2.797	3.304
62						2.428	2.654	2.876	2.987	3.527
64						2.587	2.828	3.065	3.182	3.758
66							3.007	3.259	3.384	3.997
68							3.192	3.460	3.592	4.242
70							3.382	3.666	3.806	4.495
72							3.578	3.878	4.027	4.756
74							3.779	4.096	4.253	5.023

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9354 ; R2 = 0.0957 ; R3 = -1.1613

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.127 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 2421 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.033	0.034	0.037	0.040	0.043	0.045		
12	0.022	0.040	0.055	0.058	0.063	0.068	0.072	0.076		
14	0.033	0.059	0.081	0.085	0.092	0.099	0.106	0.112	0.115	0.128
16	0.045	0.081	0.110	0.115	0.126	0.135	0.144	0.152	0.156	0.174
18		0.104	0.143	0.150	0.163	0.175	0.186	0.197	0.202	0.226
20		0.131	0.179	0.188	0.204	0.219	0.234	0.247	0.253	0.283
22		0.160	0.219	0.229	0.249	0.268	0.286	0.302	0.310	0.346
24		0.192	0.263	0.275	0.299	0.322	0.343	0.362	0.372	0.415
26			0.310	0.325	0.353	0.380	0.404	0.427	0.439	0.489
28			0.361	0.378	0.411	0.442	0.471	0.498	0.511	0.570
30			0.416	0.436	0.474	0.509	0.542	0.574	0.588	0.657
32			0.474	0.497	0.540	0.581	0.619	0.654	0.671	0.749
34			0.537	0.563	0.612	0.657	0.700	0.740	0.760	0.847
36			0.603	0.632	0.687	0.738	0.786	0.832	0.853	0.952
38			0.673	0.705	0.766	0.824	0.877	0.928	0.952	1.062
40			0.746	0.782	0.850	0.914	0.973	1.029	1.056	1.178
42			0.824	0.863	0.938	1.009	1.074	1.136	1.166	1.301
44			0.905	0.948	1.031	1.108	1.180	1.248	1.280	1.429
46			0.990	1.037	1.128	1.212	1.291	1.365	1.401	1.563
48			1.079	1.130	1.229	1.321	1.407	1.488	1.526	1.703
50				1.227	1.334	1.434	1.527	1.615	1.657	1.849
52				1.328	1.444	1.552	1.653	1.748	1.793	2.001
54				1.433	1.558	1.674	1.783	1.886	1.935	2.159
56				1.542	1.676	1.801	1.919	2.029	2.082	2.323
58						1.933	2.059	2.177	2.234	2.492
60						2.069	2.204	2.331	2.391	2.668
62						2.210	2.354	2.490	2.554	2.850
64						2.356	2.509	2.654	2.722	3.037
66							2.669	2.823	2.896	3.231
68							2.834	2.997	3.075	3.431
70							3.004	3.177	3.259	3.636
72							3.179	3.361	3.449	3.848
74							3.358	3.551	3.644	4.065

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9087 ; R2 = -0.3049 ; R3 = -0.5107

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.176 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1272 TREES FROM QUE., ONT., ALTA.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.012	0.022	0.032	0.034	0.037	0.040	0.043	0.046		
12	0.020	0.038	0.054	0.057	0.062	0.068	0.073	0.078		
14	0.029	0.055	0.078	0.083	0.091	0.099	0.106	0.114	0.117	0.134
16	0.040	0.075	0.106	0.112	0.123	0.134	0.144	0.154	0.159	0.181
18		0.097	0.137	0.145	0.159	0.173	0.186	0.199	0.205	0.234
20		0.121	0.172	0.181	0.199	0.216	0.233	0.249	0.257	0.293
22		0.148	0.209	0.221	0.243	0.264	0.285	0.304	0.313	0.358
24		0.177	0.251	0.265	0.291	0.317	0.341	0.364	0.375	0.429
26			0.296	0.312	0.343	0.373	0.402	0.429	0.443	0.505
28			0.345	0.363	0.400	0.435	0.468	0.500	0.515	0.588
30			0.397	0.418	0.460	0.500	0.539	0.576	0.593	0.677
32			0.452	0.477	0.525	0.571	0.614	0.656	0.677	0.773
34			0.512	0.540	0.594	0.645	0.695	0.742	0.765	0.874
36			0.575	0.606	0.667	0.725	0.780	0.834	0.859	0.981
38			0.641	0.676	0.744	0.809	0.871	0.930	0.959	1.095
40			0.711	0.750	0.825	0.897	0.966	1.032	1.064	1.214
42			0.785	0.827	0.910	0.990	1.066	1.138	1.174	1.340
44			0.862	0.909	1.000	1.087	1.170	1.250	1.289	1.471
46			0.943	0.994	1.094	1.189	1.280	1.368	1.410	1.609
48			1.027	1.083	1.191	1.295	1.395	1.490	1.536	1.753
50				1.176	1.294	1.406	1.514	1.617	1.668	1.904
52				1.272	1.400	1.522	1.638	1.750	1.805	2.060
54				1.373	1.510	1.642	1.768	1.888	1.947	2.222
56				1.477	1.625	1.766	1.902	2.031	2.094	2.391
58						1.895	2.040	2.180	2.247	2.565
60						2.029	2.184	2.333	2.406	2.746
62						2.167	2.333	2.492	2.569	2.933
64						2.309	2.486	2.656	2.739	3.126
66							2.645	2.825	2.913	3.325
68							2.808	3.000	3.093	3.530
70							2.976	3.179	3.278	3.742
72							3.149	3.364	3.469	3.959
74							3.327	3.554	3.664	4.183

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.8778 ; R2 = -0.2417 ; R3 = -0.6247

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.181 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1733 TREES FROM QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

MAPLE / ACER L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.012	0.022	0.032	0.034	0.038	0.042	0.045	0.048		
12	0.020	0.038	0.055	0.058	0.064	0.071	0.076	0.082		
14	0.029	0.055	0.080	0.085	0.094	0.103	0.111	0.120	0.124	0.143
16	0.039	0.075	0.108	0.114	0.126	0.138	0.150	0.161	0.167	0.193
18		0.096	0.139	0.147	0.163	0.178	0.193	0.207	0.214	0.248
20		0.120	0.173	0.183	0.203	0.222	0.241	0.259	0.268	0.310
22		0.146	0.211	0.223	0.247	0.270	0.293	0.315	0.326	0.377
24		0.175	0.252	0.267	0.295	0.323	0.350	0.376	0.389	0.451
26			0.297	0.314	0.348	0.380	0.412	0.443	0.458	0.531
28			0.345	0.365	0.404	0.442	0.479	0.515	0.533	0.617
30			0.396	0.419	0.465	0.508	0.551	0.592	0.612	0.709
32			0.451	0.478	0.529	0.579	0.628	0.675	0.698	0.808
34			0.510	0.540	0.598	0.654	0.709	0.762	0.788	0.912
36			0.572	0.606	0.671	0.734	0.796	0.855	0.884	1.024
38			0.638	0.675	0.748	0.819	0.887	0.953	0.986	1.141
40			0.707	0.749	0.829	0.907	0.983	1.057	1.093	1.265
42			0.780	0.826	0.915	1.001	1.084	1.166	1.205	1.395
44			0.857	0.906	1.004	1.099	1.191	1.280	1.323	1.532
46			0.936	0.991	1.098	1.201	1.302	1.399	1.447	1.675
48			1.020	1.079	1.196	1.308	1.418	1.524	1.576	1.824
50				1.171	1.298	1.420	1.538	1.654	1.710	1.980
52				1.267	1.404	1.536	1.664	1.789	1.850	2.142
54				1.367	1.514	1.657	1.795	1.929	1.995	2.310
56				1.470	1.628	1.782	1.931	2.075	2.146	2.484
58						1.912	2.071	2.226	2.302	2.665
60						2.046	2.217	2.383	2.464	2.853
62						2.185	2.367	2.545	2.631	3.046
64						2.328	2.523	2.712	2.804	3.246
66							2.683	2.884	2.982	3.453
68							2.848	3.062	3.166	3.665
70							3.019	3.245	3.355	3.884
72							3.194	3.433	3.550	4.110
74							3.374	3.626	3.750	4.341

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 3967 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BASSWOOD / TILIA AMERICANA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.011	0.022	0.031	0.033	0.037	0.041	0.044	0.047		
12	0.019	0.037	0.053	0.057	0.063	0.069	0.075	0.081		
14	0.028	0.054	0.078	0.082	0.091	0.100	0.109	0.117	0.121	0.141
16	0.037	0.072	0.105	0.111	0.123	0.135	0.147	0.158	0.163	0.190
18		0.093	0.135	0.143	0.159	0.174	0.189	0.203	0.210	0.244
20		0.116	0.168	0.178	0.198	0.217	0.235	0.253	0.262	0.305
22		0.141	0.205	0.217	0.241	0.264	0.287	0.309	0.319	0.371
24		0.169	0.245	0.259	0.288	0.316	0.343	0.369	0.382	0.444
26			0.288	0.305	0.339	0.371	0.403	0.434	0.449	0.522
28			0.335	0.355	0.394	0.432	0.469	0.504	0.522	0.607
30			0.385	0.408	0.453	0.496	0.539	0.580	0.600	0.698
32			0.439	0.465	0.516	0.565	0.614	0.661	0.684	0.795
34			0.496	0.525	0.583	0.639	0.693	0.747	0.773	0.898
36			0.556	0.589	0.654	0.717	0.778	0.838	0.867	1.008
38			0.620	0.657	0.729	0.799	0.867	0.934	0.966	1.123
40			0.687	0.728	0.808	0.886	0.961	1.035	1.071	1.245
42			0.758	0.803	0.891	0.977	1.060	1.142	1.182	1.373
44			0.832	0.882	0.978	1.073	1.164	1.253	1.297	1.508
46			0.910	0.964	1.070	1.173	1.273	1.370	1.418	1.648
48			0.991	1.050	1.165	1.277	1.386	1.492	1.545	1.795
50				1.139	1.264	1.386	1.504	1.620	1.676	1.948
52				1.233	1.368	1.499	1.627	1.752	1.813	2.108
54				1.329	1.475	1.617	1.755	1.890	1.956	2.273
56				1.430	1.587	1.739	1.888	2.033	2.104	2.445
58						1.866	2.025	2.181	2.257	2.623
60						1.997	2.168	2.334	2.415	2.807
62						2.133	2.315	2.492	2.579	2.998
64						2.273	2.467	2.656	2.749	3.195
66							2.624	2.825	2.923	3.398
68							2.785	2.999	3.103	3.607
70							2.952	3.178	3.289	3.823
72							3.123	3.362	3.480	4.044
74							3.299	3.552	3.676	4.272

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 140 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BEECH / FAGUS GRANDIFOLIA EHRH.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.026	0.037	0.039	0.043	0.047	0.051	0.055		
12	0.023	0.044	0.063	0.066	0.073	0.080	0.087	0.093		
14	0.033	0.063	0.091	0.096	0.107	0.117	0.126	0.136	0.140	0.162
16	0.045	0.085	0.123	0.130	0.144	0.157	0.170	0.183	0.189	0.219
18		0.110	0.158	0.167	0.185	0.203	0.219	0.236	0.244	0.282
20		0.137	0.197	0.209	0.231	0.253	0.274	0.294	0.304	0.351
22		0.167	0.240	0.254	0.281	0.308	0.333	0.358	0.370	0.428
24		0.200	0.287	0.304	0.336	0.368	0.398	0.428	0.442	0.511
26			0.338	0.358	0.396	0.433	0.469	0.504	0.521	0.602
28			0.393	0.416	0.460	0.503	0.545	0.585	0.605	0.699
30			0.452	0.478	0.529	0.579	0.627	0.673	0.696	0.804
32			0.515	0.544	0.603	0.659	0.714	0.767	0.792	0.916
34			0.582	0.615	0.681	0.745	0.806	0.866	0.895	1.035
36			0.652	0.690	0.764	0.835	0.905	0.972	1.005	1.161
38			0.727	0.769	0.852	0.931	1.009	1.083	1.120	1.295
40			0.806	0.853	0.944	1.033	1.118	1.201	1.242	1.435
42			0.889	0.941	1.041	1.139	1.233	1.325	1.369	1.583
44			0.976	1.033	1.143	1.250	1.354	1.454	1.503	1.738
46			1.067	1.129	1.250	1.367	1.480	1.590	1.644	1.900
48			1.162	1.230	1.361	1.489	1.612	1.732	1.790	2.069
50				1.335	1.477	1.616	1.750	1.879	1.943	2.246
52				1.444	1.598	1.748	1.893	2.033	2.102	2.429
54				1.557	1.724	1.885	2.041	2.193	2.267	2.620
56				1.675	1.854	2.028	2.196	2.358	2.438	2.818
58						2.175	2.355	2.530	2.616	3.024
60						2.328	2.521	2.708	2.799	3.236
62						2.486	2.692	2.892	2.989	3.456
64						2.649	2.869	3.082	3.186	3.683
66							3.051	3.277	3.388	3.917
68							3.239	3.479	3.597	4.158
70							3.433	3.687	3.812	4.406
72							3.632	3.901	4.033	4.662
74							3.837	4.121	4.260	4.925

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 388 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BLACK CHERRY / PRUNUS SEROTINA EHRH.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.012	0.024	0.036	0.038	0.043	0.048	0.052	0.057		
12	0.020	0.040	0.061	0.065	0.073	0.081	0.089	0.097		
14	0.029	0.059	0.088	0.094	0.106	0.117	0.129	0.141	0.147	0.176
16	0.040	0.079	0.119	0.127	0.143	0.158	0.174	0.190	0.198	0.237
18		0.102	0.153	0.163	0.184	0.204	0.224	0.244	0.254	0.305
20		0.127	0.191	0.204	0.229	0.254	0.279	0.305	0.317	0.380
22		0.155	0.232	0.248	0.279	0.310	0.340	0.371	0.386	0.463
24		0.185	0.278	0.296	0.333	0.370	0.407	0.443	0.462	0.553
26			0.327	0.349	0.392	0.435	0.479	0.522	0.544	0.651
28			0.380	0.405	0.456	0.506	0.556	0.607	0.632	0.757
30			0.437	0.466	0.524	0.582	0.640	0.697	0.726	0.870
32			0.498	0.531	0.597	0.663	0.729	0.795	0.827	0.992
34			0.562	0.600	0.674	0.749	0.823	0.898	0.935	1.120
36			0.631	0.673	0.757	0.840	0.924	1.007	1.049	1.257
38			0.704	0.750	0.844	0.937	1.030	1.123	1.169	1.401
40			0.780	0.832	0.935	1.038	1.142	1.245	1.296	1.553
42			0.860	0.917	1.031	1.145	1.259	1.373	1.430	1.713
44			0.944	1.007	1.132	1.257	1.382	1.507	1.570	1.881
46			1.032	1.101	1.238	1.375	1.511	1.648	1.716	2.056
48			1.124	1.199	1.348	1.497	1.646	1.795	1.869	2.240
50				1.301	1.463	1.625	1.786	1.948	2.028	2.431
52				1.408	1.583	1.758	1.932	2.107	2.194	2.629
54				1.518	1.707	1.896	2.084	2.273	2.367	2.836
56				1.633	1.836	2.039	2.242	2.444	2.545	3.050
58						2.188	2.405	2.622	2.731	3.273
60						2.341	2.574	2.807	2.923	3.502
62						2.500	2.749	2.997	3.121	3.740
64						2.664	2.929	3.194	3.326	3.986
66							3.115	3.397	3.537	4.239
68							3.307	3.606	3.755	4.500
70							3.505	3.821	3.990	4.769
72							3.708	4.043	4.210	5.046
74							3.917	4.271	4.448	5.330

EQUATION: $VM=V*(R1 + R2*X3 + R3*X3*X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

$X3 = (T*T/(C*D*((1 - 0.04365*B2)**2)))*(1 + S/H)$

T = TOP DIAMETER ; C = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 21 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

WHITE ELM / ULMUS AMERICANA L.

CBHOE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.010	0.020	0.030	0.032	0.035	0.039	0.043	0.046		
12	0.018	0.035	0.051	0.054	0.060	0.066	0.072	0.078		
14	0.026	0.050	0.074	0.078	0.087	0.096	0.105	0.114	0.118	0.139
16	0.035	0.068	0.100	0.106	0.118	0.130	0.142	0.153	0.159	0.187
18		0.087	0.128	0.136	0.152	0.167	0.182	0.197	0.205	0.240
20		0.109	0.160	0.170	0.189	0.209	0.227	0.246	0.255	0.300
22		0.133	0.195	0.207	0.231	0.254	0.277	0.300	0.311	0.365
24		0.159	0.233	0.247	0.276	0.303	0.331	0.358	0.371	0.436
26			0.274	0.291	0.324	0.357	0.390	0.421	0.437	0.514
28			0.318	0.338	0.377	0.415	0.453	0.490	0.508	0.597
30			0.366	0.389	0.433	0.477	0.521	0.563	0.584	0.686
32			0.417	0.443	0.494	0.544	0.593	0.641	0.665	0.782
34			0.471	0.500	0.558	0.614	0.670	0.725	0.752	0.884
36			0.528	0.561	0.626	0.689	0.752	0.813	0.843	0.991
38			0.589	0.626	0.698	0.768	0.838	0.907	0.940	1.105
40			0.653	0.693	0.773	0.852	0.929	1.005	1.042	1.225
42			0.720	0.765	0.853	0.940	1.025	1.108	1.150	1.351
44			0.791	0.840	0.936	1.032	1.125	1.217	1.262	1.483
46			0.864	0.918	1.024	1.128	1.230	1.330	1.380	1.622
48			0.941	1.000	1.115	1.228	1.339	1.449	1.503	1.766
50				1.085	1.210	1.333	1.454	1.572	1.631	1.917
52				1.174	1.309	1.442	1.573	1.701	1.764	2.074
54				1.266	1.412	1.555	1.696	1.835	1.903	2.236
56				1.362	1.519	1.673	1.824	1.973	2.047	2.406
58						1.795	1.957	2.117	2.196	2.581
60						1.921	2.095	2.266	2.350	2.762
62						2.051	2.237	2.420	2.510	2.949
64						2.186	2.384	2.578	2.675	3.143
66							2.535	2.742	2.845	3.343
68							2.691	2.911	3.020	3.549
70							2.852	3.085	3.200	3.761
72							3.018	3.264	3.386	3.979
74							3.188	3.448	3.577	4.203

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 62 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

IFCNWCOC / OSTRYA VIRGINIANA (MILL.) K. KOCH

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.033	0.035	0.038	0.041	0.044	0.047		
12	0.022	0.040	0.056	0.059	0.065	0.070	0.075	0.080		
14	0.032	0.059	0.082	0.086	0.094	0.102	0.109	0.116	0.119	0.135
16	0.043	0.079	0.110	0.116	0.127	0.137	0.147	0.156	0.161	0.182
18		0.102	0.142	0.150	0.164	0.177	0.189	0.201	0.207	0.234
20		0.127	0.177	0.187	0.204	0.221	0.236	0.251	0.258	0.292
22		0.155	0.216	0.227	0.248	0.269	0.288	0.306	0.315	0.355
24		0.186	0.258	0.271	0.297	0.321	0.344	0.365	0.376	0.424
26			0.304	0.320	0.350	0.378	0.405	0.430	0.442	0.499
28			0.353	0.371	0.406	0.439	0.470	0.500	0.514	0.580
30			0.406	0.427	0.467	0.505	0.541	0.575	0.591	0.667
32			0.463	0.486	0.532	0.575	0.616	0.655	0.673	0.760
34			0.523	0.550	0.601	0.650	0.696	0.740	0.761	0.859
36			0.586	0.617	0.674	0.729	0.781	0.830	0.854	0.964
38			0.654	0.687	0.752	0.813	0.871	0.925	0.952	1.074
40			0.725	0.762	0.834	0.901	0.965	1.026	1.055	1.191
42			0.799	0.841	0.919	0.994	1.065	1.132	1.164	1.313
44			0.878	0.923	1.009	1.091	1.169	1.242	1.278	1.442
46			0.960	1.009	1.103	1.193	1.278	1.358	1.397	1.576
48			1.045	1.099	1.202	1.299	1.392	1.479	1.521	1.717
50				1.192	1.304	1.410	1.510	1.605	1.651	1.863
52				1.290	1.411	1.525	1.634	1.737	1.786	2.016
54				1.391	1.522	1.645	1.762	1.873	1.926	2.174
56				1.497	1.637	1.770	1.895	2.015	2.072	2.338
58						1.898	2.033	2.161	2.223	2.509
60						2.032	2.176	2.313	2.379	2.685
62						2.170	2.324	2.470	2.541	2.867
64						2.312	2.476	2.632	2.707	3.055
66							2.634	2.800	2.879	3.250
68							2.796	2.972	3.057	3.450
70							2.963	3.150	3.239	3.656
72							3.135	3.332	3.427	3.868
74							3.312	3.520	3.621	4.086

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 147 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

RED OAK / QUERCUS RUBRA L.

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.034	0.036	0.040	0.043	0.046	0.050		
12	0.022	0.041	0.058	0.061	0.068	0.073	0.079	0.084		
14	0.032	0.060	0.085	0.089	0.098	0.107	0.115	0.122	0.126	0.144
16	0.043	0.081	0.114	0.120	0.132	0.144	0.155	0.165	0.170	0.194
18		0.104	0.147	0.155	0.170	0.185	0.199	0.212	0.219	0.249
20		0.130	0.183	0.193	0.212	0.231	0.248	0.265	0.273	0.311
22		0.158	0.223	0.235	0.259	0.281	0.302	0.322	0.332	0.378
24		0.189	0.267	0.281	0.309	0.336	0.361	0.385	0.397	0.452
26			0.314	0.331	0.364	0.395	0.425	0.454	0.467	0.532
28			0.365	0.385	0.423	0.459	0.494	0.527	0.543	0.619
30			0.420	0.443	0.486	0.528	0.568	0.606	0.625	0.711
32			0.478	0.504	0.554	0.602	0.647	0.691	0.712	0.810
34			0.541	0.570	0.626	0.680	0.731	0.780	0.804	0.915
36			0.607	0.639	0.702	0.763	0.820	0.875	0.902	1.027
38			0.676	0.713	0.783	0.850	0.914	0.976	1.006	1.145
40			0.750	0.790	0.868	0.943	1.014	1.082	1.115	1.269
42			0.827	0.871	0.957	1.040	1.118	1.193	1.230	1.400
44			0.908	0.957	1.051	1.141	1.228	1.310	1.350	1.537
46			0.992	1.046	1.149	1.248	1.342	1.432	1.476	1.680
48			1.081	1.139	1.252	1.359	1.462	1.560	1.607	1.830
50				1.236	1.358	1.475	1.586	1.693	1.744	1.986
52				1.337	1.469	1.595	1.716	1.831	1.887	2.149
54				1.442	1.585	1.721	1.851	1.975	2.035	2.317
56				1.551	1.705	1.851	1.991	2.124	2.189	2.493
58						1.986	2.136	2.279	2.348	2.674
60						2.125	2.286	2.439	2.513	2.862
62						2.269	2.441	2.605	2.684	3.056
64						2.418	2.601	2.776	2.860	3.257
66							2.766	2.952	3.042	3.464
68							2.937	3.134	3.229	3.677
70							3.112	3.321	3.422	3.897
72							3.293	3.514	3.621	4.123
74							3.478	3.712	3.825	4.355

EQUATION: VM=V*(R1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 40 TREES FROM ONT.

APPENDIX III Ratio of Merchantable Volume to Total Volume

	PAGE
Volume distribution over the tree stem	68
Stump height 0.15 m length ratio of 5%	69
Stump height 0.30 m length ratio of 5%	70
Stump height 0.15 m top diameter inside bark 7.0 cm	71
Stump height 0.15 m top diameter inside bark 11.0 cm	72
Stump height 0.15 m top diameter inside bark 15.0 cm	73
Stump height 0.15 m top diameter inside bark 19.0 cm	74
Stump height 0.15 m top diameter inside bark 23.0 cm	75
Stump height 0.15 m top diameter inside bark 27.0 cm	76
Stump height 0.30 m top diameter inside bark 7.0 cm	77
Stump height 0.30 m top diameter inside bark 11.0 cm	78
Stump height 0.30 m top diameter inside bark 15.0 cm	79
Stump height 0.30 m top diameter inside bark 19.0 cm	80
Stump height 0.30 m top diameter inside bark 23.0 cm	81
Stump height 0.30 m top diameter inside bark 27.0 cm	82

VOLUME DISTRIBUTION OVER THE TREE STEM

1) Proportions of total stem volume determined for specified proportions of total tree height using the height-ratio method and the all species coefficients from Table 4.

% Height	% Volume
10	21.76
15	30.97
20	39.60
25	47.65
30	55.12
35	62.00
40	68.30
45	74.03
50	79.17
55	83.73
60	87.70
65	91.10
70	93.92
75	96.15
80	97.80
85	98.87
90	99.36
95	99.36

2) Proportions of total stem volume determined for specified ratios of top diameter inside bark to diameter breast height outside bark using the squared diameter ratio method and the all species coefficients from Table 5.

Ratio	% Volume
0.10	100.00
0.15	100.00
0.20	100.00
0.25	99.69
0.30	98.88
0.35	97.75
0.40	96.22
0.45	94.21
0.50	91.59
0.55	88.26
0.60	84.07
0.65	78.87
0.70	72.52
0.75	64.83
0.80	55.63
0.85	44.71
0.90	31.87
0.95	16.88

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M)

	TOTAL HEIGHT (M)									
X1	5	10	15	16	18	20	22	24	25	30
.10	0.1387	0.1699	0.1805	0.1818	0.1840	0.1857	0.1872	0.1884	0.1889	0.1910
.15	0.2308	0.2621	0.2726	0.2739	0.2761	0.2779	0.2793	0.2805	0.2810	0.2832
.20	0.3171	0.3484	0.3589	0.3602	0.3624	0.3642	0.3656	0.3668	0.3673	0.3695
.25	0.3976	0.4288	0.4394	0.4407	0.4429	0.4446	0.4461	0.4473	0.4478	0.4499
.30	0.4723	0.5035	0.5140	0.5154	0.5176	0.5193	0.5208	0.5220	0.5225	0.5246
.35	0.5412	0.5724	0.5829	0.5842	0.5864	0.5882	0.5896	0.5908	0.5913	0.5935
.40	0.6042	0.6354	0.6459	0.6472	0.6494	0.6512	0.6527	0.6539	0.6544	0.6565
.45	0.6614	0.6926	0.7032	0.7045	0.7067	0.7084	0.7099	0.7111	0.7116	0.7137
.50	0.7128	0.7440	0.7546	0.7559	0.7581	0.7598	0.7613	0.7625	0.7630	0.7651
.55	0.7584	0.7896	0.8002	0.8015	0.8037	0.8054	0.8069	0.8081	0.8086	0.8107
.60	0.7982	0.8294	0.8399	0.8412	0.8434	0.8452	0.8467	0.8479	0.8484	0.8505
.65	0.8322	0.8634	0.8739	0.8752	0.8774	0.8792	0.8806	0.8818	0.8823	0.8845
.70	0.8603	0.8915	0.9020	0.9034	0.9056	0.9073	0.9088	0.9100	0.9105	0.9126
.75	0.8826	0.9138	0.9244	0.9257	0.9279	0.9296	0.9311	0.9323	0.9328	0.9349
.80	0.8991	0.9304	0.9409	0.9422	0.9444	0.9462	0.9476	0.9488	0.9493	0.9515
.85	0.9098	0.9411	0.9516	0.9529	0.9551	0.9569	0.9583	0.9595	0.9600	0.9622
.90	0.9147	0.9459	0.9565	0.9578	0.9600	0.9617	0.9632	0.9644	0.9649	0.9670

EQUATION: VM/V = P2*(X1 - X12) + P3*(X1*X1 - X12*X12)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; P2 = 2.1331 ; P3 = -1.1631

X1 = HM/H ; X12 = S/H

HM = HEIGHT TO MERCHANTABLE LIMIT ; H = TOTAL HEIGHT

S = STUMP HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M)

	TOTAL HEIGHT (M)									
X1	5	10	15	16	18	20	22	24	25	30
.10	0.0779	0.1387	0.1595	0.1621	0.1665	0.1699	0.1728	0.1752	0.1762	0.1805
.15	0.1700	0.2308	0.2516	0.2542	0.2586	0.2621	0.2649	0.2673	0.2684	0.2726
.20	0.2563	0.3171	0.3379	0.3405	0.3449	0.3484	0.3512	0.3536	0.3547	0.3589
.25	0.3368	0.3976	0.4184	0.4210	0.4254	0.4288	0.4317	0.4341	0.4352	0.4394
.30	0.4115	0.4723	0.4931	0.4957	0.5000	0.5035	0.5064	0.5088	0.5098	0.5140
.35	0.4803	0.5412	0.5619	0.5645	0.5689	0.5724	0.5752	0.5776	0.5787	0.5829
.40	0.5433	0.6042	0.6249	0.6276	0.6319	0.6354	0.6383	0.6407	0.6417	0.6459
.45	0.6006	0.6614	0.6822	0.6848	0.6891	0.6926	0.6955	0.6979	0.6989	0.7032
.50	0.6520	0.7128	0.7336	0.7362	0.7405	0.7440	0.7469	0.7493	0.7503	0.7546
.55	0.6976	0.7584	0.7792	0.7818	0.7861	0.7896	0.7925	0.7949	0.7959	0.8002
.60	0.7373	0.7982	0.8189	0.8216	0.8259	0.8294	0.8323	0.8347	0.8357	0.8399
.65	0.7713	0.8322	0.8529	0.8555	0.8599	0.8634	0.8662	0.8686	0.8697	0.8739
.70	0.7995	0.8603	0.8811	0.8837	0.8880	0.8915	0.8944	0.8968	0.8978	0.9020
.75	0.8218	0.8826	0.9034	0.9060	0.9104	0.9138	0.9167	0.9191	0.9202	0.9244
.80	0.8383	0.8991	0.9199	0.9225	0.9269	0.9304	0.9332	0.9356	0.9367	0.9409
.85	0.8490	0.9098	0.9306	0.9332	0.9376	0.9411	0.9439	0.9463	0.9474	0.9516
.90	0.8539	0.9147	0.9355	0.9381	0.9424	0.9459	0.9488	0.9512	0.9522	0.9565

EQUATION: VM/V = P2*(X1 - X12) + P3*(X1*X1 - X12*X12)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; P2 = 2.1331 ; P3 = -1.1631

X1 = HM/H ; X12 = S/H

HM = HEIGHT TO MERCHANTABLE LIMIT ; H = TOTAL HEIGHT

S = STUMP HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

CBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.6696	0.6768	0.6792	0.6794	0.6799	0.6803	0.6807	0.6809		
12	0.8021	0.8059	0.8071	0.8073	0.8075	0.8077	0.8079	0.8080		
14	0.8635	0.8657	0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
16	0.8958	0.8972	0.8977	0.8977	0.8978	0.8979	0.8980	0.8980	0.8980	0.8981
18		0.9155	0.9158	0.9159	0.9159	0.9160	0.9160	0.9161	0.9161	0.9162
20		0.9270	0.9272	0.9272	0.9273	0.9273	0.9274	0.9274	0.9274	0.9274
22		0.9346	0.9347	0.9348	0.9348	0.9348	0.9349	0.9349	0.9349	0.9349
24		0.9398	0.9400	0.9400	0.9400	0.9400	0.9401	0.9401	0.9401	0.9401
26			0.9437	0.9438	0.9438	0.9438	0.9439	0.9438	0.9438	0.9439
28			0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466
30			0.9487	0.9487	0.9487	0.9487	0.9487	0.9488	0.9488	0.9488
32			0.9504	0.9504	0.9504	0.9504	0.9504	0.9504	0.9504	0.9504
34			0.9517	0.9517	0.9517	0.9517	0.9517	0.9518	0.9518	0.9518
36			0.9528	0.9528	0.9528	0.9528	0.9528	0.9528	0.9528	0.9528
38			0.9537	0.9537	0.9537	0.9537	0.9537	0.9537	0.9537	0.9537
40			0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9545
42			0.9550	0.9550	0.9551	0.9551	0.9551	0.9551	0.9551	0.9551
44			0.9556	0.9556	0.9556	0.9556	0.9556	0.9556	0.9556	0.9556
46			0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
48			0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9564
50				0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568
52				0.9571	0.9571	0.9571	0.9571	0.9571	0.9571	0.9571
54				0.9573	0.9573	0.9573	0.9573	0.9573	0.9573	0.9573
56				0.9575	0.9575	0.9576	0.9576	0.9576	0.9576	0.9576
58						0.9578	0.9578	0.9578	0.9578	0.9578
60						0.9579	0.9579	0.9579	0.9579	0.9579
62						0.9581	0.9581	0.9581	0.9581	0.9581
64						0.9583	0.9583	0.9583	0.9583	0.9583
66							0.9584	0.9584	0.9584	0.9584
68							0.9585	0.9585	0.9585	0.9585
70							0.9586	0.9586	0.9586	0.9586
72							0.9587	0.9587	0.9587	0.9587
74							0.9588	0.9588	0.9588	0.9588

EQUATION: VM/V = R1 + R2*X3 + R3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = CBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 11.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
14	0.5266	0.5376	0.5412	0.5417	0.5424	0.5430	0.5435	0.5440	0.5441	0.5449
16	0.6869	0.6936	0.6959	0.6961	0.6966	0.6970	0.6973	0.6975	0.6976	0.6981
18		0.7805	0.7819	0.7821	0.7824	0.7827	0.7829	0.7830	0.7831	0.7834
20		0.8325	0.8335	0.8337	0.8339	0.8340	0.8342	0.8343	0.8343	0.8345
22		0.8657	0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
24		0.8878	0.8883	0.8884	0.8885	0.8886	0.8887	0.8887	0.8887	0.8889
26			0.9036	0.9036	0.9037	0.9038	0.9038	0.9039	0.9039	0.9040
28			0.9145	0.9146	0.9146	0.9147	0.9147	0.9148	0.9148	0.9149
30			0.9226	0.9227	0.9227	0.9228	0.9228	0.9228	0.9228	0.9229
32			0.9288	0.9288	0.9289	0.9289	0.9289	0.9290	0.9290	0.9290
34			0.9336	0.9336	0.9336	0.9337	0.9337	0.9337	0.9337	0.9338
36			0.9373	0.9374	0.9374	0.9374	0.9374	0.9375	0.9375	0.9375
38			0.9404	0.9404	0.9404	0.9404	0.9405	0.9405	0.9405	0.9405
40			0.9428	0.9428	0.9429	0.9429	0.9429	0.9429	0.9429	0.9429
42			0.9449	0.9449	0.9449	0.9449	0.9449	0.9449	0.9449	0.9450
44			0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466
46			0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9481
48			0.9492	0.9492	0.9492	0.9492	0.9492	0.9493	0.9493	0.9493
50				0.9503	0.9503	0.9503	0.9503	0.9503	0.9503	0.9503
52				0.9512	0.9512	0.9512	0.9512	0.9512	0.9512	0.9512
54				0.9519	0.9519	0.9520	0.9520	0.9520	0.9520	0.9520
56				0.9526	0.9526	0.9526	0.9526	0.9527	0.9527	0.9527
58						0.9532	0.9532	0.9533	0.9533	0.9533
60						0.9538	0.9538	0.9538	0.9538	0.9538
62						0.9543	0.9543	0.9543	0.9543	0.9543
64						0.9547	0.9547	0.9547	0.9547	0.9547
66							0.9551	0.9551	0.9551	0.9551
68							0.9554	0.9554	0.9554	0.9554
70							0.9557	0.9557	0.9557	0.9557
72							0.9560	0.9560	0.9560	0.9560
74							0.9563	0.9563	0.9563	0.9563

EQUATION: VM/V = R1 + R2*X3 + R3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 15.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
18		0.4402	0.4447	0.4453	0.4462	0.4470	0.4476	0.4481	0.4484	0.4493
20		0.6009	0.6039	0.6043	0.6049	0.6054	0.6059	0.6062	0.6064	0.6070
22		0.7010	0.7032	0.7035	0.7039	0.7043	0.7046	0.7048	0.7049	0.7054
24		0.7666	0.7682	0.7684	0.7687	0.7690	0.7692	0.7694	0.7695	0.7698
26			0.8125	0.8126	0.8129	0.8131	0.8132	0.8134	0.8134	0.8137
28			0.8437	0.8438	0.8440	0.8442	0.8443	0.8444	0.8444	0.8446
30			0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
32			0.8833	0.8833	0.8834	0.8835	0.8836	0.8837	0.8837	0.8838
34			0.8961	0.8961	0.8962	0.8963	0.8964	0.8964	0.8965	0.8966
36			0.9060	0.9061	0.9062	0.9062	0.9063	0.9063	0.9064	0.9064
38			0.9139	0.9139	0.9140	0.9141	0.9141	0.9141	0.9142	0.9142
40			0.9202	0.9202	0.9203	0.9203	0.9204	0.9204	0.9204	0.9205
42			0.9253	0.9253	0.9254	0.9254	0.9255	0.9255	0.9255	0.9255
44			0.9295	0.9295	0.9296	0.9296	0.9296	0.9297	0.9297	0.9297
46			0.9330	0.9330	0.9331	0.9331	0.9331	0.9331	0.9332	0.9332
48			0.9359	0.9360	0.9360	0.9360	0.9360	0.9361	0.9361	0.9361
50				0.9384	0.9385	0.9385	0.9385	0.9385	0.9385	0.9386
52				0.9406	0.9406	0.9406	0.9406	0.9406	0.9407	0.9407
54				0.9424	0.9424	0.9424	0.9425	0.9425	0.9425	0.9425
56				0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9441
58						0.9454	0.9454	0.9454	0.9454	0.9454
60						0.9466	0.9466	0.9466	0.9466	0.9466
62						0.9477	0.9477	0.9477	0.9477	0.9477
64						0.9486	0.9486	0.9486	0.9486	0.9486
66							0.9495	0.9495	0.9495	0.9495
68							0.9502	0.9502	0.9502	0.9502
70							0.9509	0.9509	0.9509	0.9509
72							0.9515	0.9515	0.9515	0.9515
74							0.9521	0.9521	0.9521	0.9521

EQUATION: VM/V = R1 + R2*X3 + R3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

X3 = (T*T/(D*C*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; C = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 19.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
22		0.3697	0.3749	0.3756	0.3767	0.3775	0.3782	0.3788	0.3791	0.3801
24		0.5263	0.5300	0.5305	0.5313	0.5319	0.5324	0.5328	0.5330	0.5337
26			0.6345	0.6348	0.6354	0.6359	0.6363	0.6366	0.6367	0.6373
28			0.7073	0.7076	0.7080	0.7084	0.7087	0.7089	0.7090	0.7094
30			0.7596	0.7598	0.7601	0.7604	0.7606	0.7608	0.7609	0.7612
32			0.7980	0.7982	0.7984	0.7987	0.7988	0.7990	0.7991	0.7993
34			0.8269	0.8271	0.8273	0.8274	0.8276	0.8277	0.8278	0.8280
36			0.8491	0.8492	0.8494	0.8495	0.8496	0.8497	0.8498	0.8500
38			0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
40			0.8801	0.8802	0.8803	0.8804	0.8805	0.8805	0.8806	0.8807
42			0.8911	0.8912	0.8913	0.8913	0.8914	0.8915	0.8915	0.8916
44			0.9000	0.9001	0.9002	0.9003	0.9003	0.9004	0.9004	0.9005
46			0.9074	0.9075	0.9075	0.9076	0.9077	0.9077	0.9077	0.9078
48			0.9135	0.9136	0.9136	0.9137	0.9137	0.9138	0.9138	0.9139
50				0.9187	0.9188	0.9188	0.9189	0.9189	0.9189	0.9190
52				0.9230	0.9231	0.9231	0.9232	0.9232	0.9232	0.9233
54				0.9268	0.9268	0.9268	0.9269	0.9269	0.9269	0.9270
56				0.9299	0.9300	0.9300	0.9300	0.9301	0.9301	0.9301
58						0.9328	0.9328	0.9328	0.9328	0.9329
60						0.9352	0.9352	0.9352	0.9352	0.9352
62						0.9372	0.9373	0.9373	0.9373	0.9373
64						0.9391	0.9391	0.9391	0.9391	0.9392
66							0.9407	0.9407	0.9408	0.9408
68							0.9422	0.9422	0.9422	0.9422
70							0.9435	0.9435	0.9435	0.9435
72							0.9446	0.9446	0.9446	0.9447
74							0.9457	0.9457	0.9457	0.9457

EQUATION: VM/V = B1 + B2*X3 + B3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1660 ; B3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 23.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
26			0.3225	0.3232	0.3244	0.3253	0.3261	0.3267	0.3270	0.3281
28			0.4703	0.4709	0.4718	0.4725	0.4731	0.4735	0.4738	0.4746
30			0.5756	0.5761	0.5767	0.5773	0.5777	0.5781	0.5783	0.5790
32			0.6526	0.6529	0.6534	0.6539	0.6542	0.6545	0.6546	0.6552
34			0.7100	0.7102	0.7107	0.7110	0.7113	0.7115	0.7116	0.7121
36			0.7537	0.7539	0.7542	0.7545	0.7547	0.7549	0.7550	0.7554
38			0.7875	0.7877	0.7879	0.7882	0.7884	0.7885	0.7886	0.7889
40			0.8141	0.8142	0.8145	0.8147	0.8149	0.8150	0.8150	0.8152
42			0.8353	0.8354	0.8356	0.8358	0.8359	0.8360	0.8361	0.8363
44			0.8524	0.8525	0.8527	0.8528	0.8529	0.8530	0.8531	0.8532
46			0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
48			0.8779	0.8780	0.8781	0.8782	0.8783	0.8784	0.8784	0.8785
50				0.8876	0.8877	0.8878	0.8879	0.8879	0.8880	0.8881
52				0.8957	0.8958	0.8958	0.8959	0.8960	0.8960	0.8961
54				0.9025	0.9026	0.9026	0.9027	0.9027	0.9028	0.9029
56				0.9083	0.9084	0.9085	0.9085	0.9086	0.9086	0.9086
58						0.9135	0.9135	0.9136	0.9136	0.9136
60						0.9178	0.9178	0.9178	0.9179	0.9179
62						0.9215	0.9216	0.9216	0.9216	0.9217
64						0.9248	0.9249	0.9249	0.9249	0.9249
66							0.9277	0.9278	0.9278	0.9278
68							0.9303	0.9303	0.9303	0.9304
70							0.9326	0.9326	0.9326	0.9326
72							0.9346	0.9346	0.9346	0.9346
74							0.9364	0.9364	0.9364	0.9364

EQUATION: VM/V = R1 + R2*X3 + R3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 27.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
30			0.2818	0.2825	0.2838	0.2848	0.2856	0.2863	0.2866	0.2878
32			0.4215	0.4221	0.4231	0.4239	0.4245	0.4251	0.4253	0.4262
34			0.5253	0.5258	0.5266	0.5272	0.5277	0.5281	0.5283	0.5291
36			0.6039	0.6043	0.6049	0.6054	0.6059	0.6062	0.6064	0.6070
38			0.6645	0.6648	0.6653	0.6657	0.6660	0.6663	0.6665	0.6670
40			0.7118	0.7121	0.7125	0.7128	0.7131	0.7134	0.7135	0.7139
42			0.7493	0.7496	0.7499	0.7502	0.7505	0.7507	0.7507	0.7511
44			0.7795	0.7797	0.7800	0.7802	0.7804	0.7806	0.7807	0.7810
46			0.8040	0.8041	0.8044	0.8046	0.8048	0.8049	0.8050	0.8052
48			0.8241	0.8242	0.8244	0.8246	0.8248	0.8249	0.8249	0.8252
50				0.8409	0.8410	0.8412	0.8413	0.8414	0.8415	0.8417
52				0.8548	0.8549	0.8551	0.8552	0.8553	0.8553	0.8555
54				0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
56				0.8764	0.8766	0.8767	0.8767	0.8768	0.8768	0.8770
58						0.8851	0.8852	0.8853	0.8853	0.8854
60						0.8924	0.8925	0.8926	0.8926	0.8927
62						0.8987	0.8988	0.8989	0.8989	0.8990
64						0.9042	0.9043	0.9043	0.9044	0.9044
66							0.9091	0.9091	0.9092	0.9092
68							0.9133	0.9134	0.9134	0.9134
70							0.9171	0.9171	0.9171	0.9172
72							0.9204	0.9204	0.9204	0.9205
74							0.9233	0.9234	0.9234	0.9234

EQUATION: VM/V = R1 + R2*X3 + R3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

X3 = (T*T/(C*C*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; C = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

DBH CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.6549	0.6696	0.6744	0.6750	0.6760	0.6768	0.6774	0.6780		
12	0.7945	0.8021	0.8046	0.8049	0.8055	0.8059	0.8062	0.8065		
14	0.8590	0.8635	0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
16	0.8930	0.8958	0.8967	0.8969	0.8970	0.8972	0.8973	0.8974	0.8975	0.8977
18		0.9146	0.9152	0.9153	0.9154	0.9155	0.9156	0.9157	0.9157	0.9158
20		0.9263	0.9268	0.9268	0.9269	0.9270	0.9270	0.9271	0.9271	0.9272
22		0.9341	0.9344	0.9344	0.9345	0.9346	0.9346	0.9347	0.9347	0.9347
24		0.9395	0.9397	0.9397	0.9398	0.9398	0.9399	0.9399	0.9399	0.9400
26			0.9435	0.9436	0.9436	0.9436	0.9437	0.9437	0.9437	0.9437
28			0.9464	0.9464	0.9464	0.9465	0.9465	0.9465	0.9465	0.9466
30			0.9486	0.9486	0.9486	0.9486	0.9487	0.9487	0.9487	0.9487
32			0.9503	0.9503	0.9503	0.9503	0.9503	0.9504	0.9504	0.9504
34			0.9516	0.9516	0.9516	0.9517	0.9517	0.9517	0.9517	0.9517
36			0.9527	0.9527	0.9527	0.9528	0.9528	0.9528	0.9528	0.9528
38			0.9536	0.9536	0.9536	0.9536	0.9537	0.9537	0.9537	0.9537
40			0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9544
42			0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
44			0.9555	0.9555	0.9555	0.9555	0.9556	0.9556	0.9556	0.9556
46			0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
48			0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9564
50				0.9567	0.9567	0.9567	0.9567	0.9567	0.9567	0.9568
52				0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570
54				0.9573	0.9573	0.9573	0.9573	0.9573	0.9573	0.9573
56				0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9575
58						0.9577	0.9577	0.9577	0.9577	0.9577
60						0.9579	0.9579	0.9579	0.9579	0.9579
62						0.9581	0.9581	0.9581	0.9581	0.9581
64						0.9582	0.9582	0.9582	0.9582	0.9582
66							0.9584	0.9584	0.9584	0.9584
68							0.9585	0.9585	0.9585	0.9585
70							0.9586	0.9586	0.9586	0.9586
72							0.9587	0.9587	0.9587	0.9587
74							0.9588	0.9588	0.9588	0.9588

EQUATION: VM/V = B1 + B2*X3 + B3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1660 ; B3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 11.3 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
14	0.5042	0.5266	0.5339	0.5349	0.5364	0.5376	0.5386	0.5394	0.5398	0.5412
16	0.6732	0.6869	0.6914	0.6920	0.6929	0.6936	0.6942	0.6948	0.6950	0.6959
18		0.7761	0.7790	0.7794	0.7800	0.7805	0.7809	0.7812	0.7814	0.7819
20		0.8295	0.8315	0.8318	0.8322	0.8325	0.8328	0.8330	0.8331	0.8335
22		0.8635	0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
24		0.8862	0.8872	0.8874	0.8876	0.8878	0.8879	0.8880	0.8881	0.8883
26			0.9027	0.9028	0.9030	0.9032	0.9033	0.9034	0.9034	0.9036
28			0.9139	0.9140	0.9141	0.9142	0.9143	0.9144	0.9144	0.9145
30			0.9221	0.9222	0.9223	0.9224	0.9225	0.9225	0.9225	0.9226
32			0.9284	0.9284	0.9285	0.9286	0.9287	0.9287	0.9287	0.9288
34			0.9332	0.9333	0.9333	0.9334	0.9334	0.9335	0.9335	0.9336
36			0.9370	0.9371	0.9371	0.9372	0.9372	0.9373	0.9373	0.9373
38			0.9401	0.9401	0.9402	0.9402	0.9403	0.9403	0.9403	0.9404
40			0.9426	0.9426	0.9427	0.9427	0.9428	0.9428	0.9428	0.9428
42			0.9447	0.9447	0.9447	0.9448	0.9448	0.9448	0.9448	0.9449
44			0.9464	0.9464	0.9464	0.9465	0.9465	0.9465	0.9465	0.9466
46			0.9478	0.9479	0.9479	0.9479	0.9479	0.9479	0.9480	0.9480
48			0.9491	0.9491	0.9491	0.9491	0.9492	0.9492	0.9492	0.9492
50				0.9501	0.9502	0.9502	0.9502	0.9502	0.9502	0.9502
52				0.9510	0.9511	0.9511	0.9511	0.9511	0.9511	0.9511
54				0.9518	0.9519	0.9519	0.9519	0.9519	0.9519	0.9519
56				0.9525	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526
58						0.9532	0.9532	0.9532	0.9532	0.9532
60						0.9537	0.9537	0.9537	0.9537	0.9538
62						0.9542	0.9542	0.9542	0.9542	0.9542
64						0.9546	0.9546	0.9546	0.9546	0.9547
66							0.9550	0.9550	0.9550	0.9550
68							0.9554	0.9554	0.9554	0.9554
70							0.9557	0.9557	0.9557	0.9557
72							0.9560	0.9560	0.9560	0.9560
74							0.9562	0.9562	0.9562	0.9562

EQUATION: VM/V = B1 + B2*X3 + B3*X3**2*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1060 ; B3 = -0.7868

X3 = (T**T/(D**C**((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 15.0 CM)

DBHCE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
18		0.4265	0.4357	0.4368	0.4387	0.4402	0.4414	0.4425	0.4429	0.4447
20		0.5916	0.5978	0.5985	0.5998	0.6009	0.6017	0.6024	0.6027	0.6039
22		0.6945	0.6989	0.6994	0.7003	0.7010	0.7016	0.7021	0.7023	0.7032
24		0.7619	0.7650	0.7654	0.7661	0.7666	0.7671	0.7674	0.7676	0.7682
26			0.8101	0.8104	0.8109	0.8113	0.8116	0.8119	0.8120	0.8125
28			0.8419	0.8421	0.8425	0.8428	0.8431	0.8433	0.8434	0.8437
30			0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
32			0.8821	0.8822	0.8825	0.8827	0.8828	0.8830	0.8830	0.8833
34			0.8951	0.8953	0.8955	0.8956	0.8957	0.8959	0.8959	0.8961
36			0.9053	0.9054	0.9055	0.9057	0.9058	0.9058	0.9059	0.9060
38			0.9132	0.9133	0.9135	0.9136	0.9137	0.9137	0.9138	0.9139
40			0.9196	0.9197	0.9198	0.9199	0.9200	0.9201	0.9201	0.9202
42			0.9248	0.9249	0.9250	0.9251	0.9251	0.9252	0.9252	0.9253
44			0.9291	0.9291	0.9292	0.9293	0.9294	0.9294	0.9294	0.9295
46			0.9326	0.9327	0.9328	0.9328	0.9329	0.9329	0.9329	0.9330
48			0.9356	0.9357	0.9357	0.9358	0.9359	0.9359	0.9359	0.9359
50				0.9382	0.9382	0.9383	0.9383	0.9384	0.9384	0.9384
52				0.9403	0.9404	0.9404	0.9405	0.9405	0.9405	0.9406
54				0.9422	0.9422	0.9423	0.9423	0.9423	0.9423	0.9424
56				0.9438	0.9438	0.9439	0.9439	0.9439	0.9439	0.9440
58						0.9453	0.9453	0.9453	0.9453	0.9453
60						0.9465	0.9465	0.9465	0.9465	0.9466
62						0.9476	0.9476	0.9476	0.9476	0.9476
64						0.9485	0.9485	0.9485	0.9485	0.9486
66							0.9494	0.9494	0.9494	0.9494
68							0.9501	0.9501	0.9502	0.9502
70							0.9508	0.9508	0.9508	0.9509
72							0.9514	0.9514	0.9515	0.9515
74							0.9520	0.9520	0.9520	0.9520

EQUATION: VM/V = B1 + B2*X3 + B3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1660 ; B3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 15.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
22		0.3541	0.3645	0.3658	0.3680	0.3697	0.3712	0.3723	0.3729	0.3749
24		0.5149	0.5225	0.5234	0.5250	0.5263	0.5273	0.5281	0.5285	0.5300
26			0.6289	0.6296	0.6308	0.6317	0.6325	0.6331	0.6334	0.6345
28			0.7031	0.7036	0.7045	0.7052	0.7058	0.7063	0.7065	0.7073
30			0.7563	0.7567	0.7574	0.7579	0.7584	0.7587	0.7589	0.7596
32			0.7954	0.7957	0.7963	0.7967	0.7971	0.7974	0.7975	0.7980
34			0.8248	0.8251	0.8255	0.8259	0.8261	0.8264	0.8265	0.8269
36			0.8473	0.8476	0.8479	0.8482	0.8485	0.8487	0.8487	0.8491
38			0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
40			0.8789	0.8790	0.8793	0.8795	0.8796	0.8798	0.8798	0.8801
42			0.8901	0.8902	0.8904	0.8906	0.8907	0.8908	0.8909	0.8911
44			0.8992	0.8993	0.8995	0.8996	0.8997	0.8998	0.8999	0.9000
46			0.9066	0.9067	0.9069	0.9070	0.9071	0.9072	0.9073	0.9074
48			0.9129	0.9129	0.9131	0.9132	0.9133	0.9134	0.9134	0.9135
50				0.9182	0.9183	0.9184	0.9185	0.9185	0.9186	0.9187
52				0.9226	0.9227	0.9228	0.9228	0.9229	0.9229	0.9230
54				0.9263	0.9264	0.9265	0.9266	0.9266	0.9266	0.9267
56				0.9296	0.9296	0.9297	0.9298	0.9298	0.9298	0.9299
58						0.9325	0.9325	0.9326	0.9326	0.9327
60						0.9349	0.9349	0.9350	0.9350	0.9351
62						0.9370	0.9371	0.9371	0.9371	0.9372
64						0.9389	0.9389	0.9389	0.9390	0.9390
66							0.9406	0.9406	0.9406	0.9407
68							0.9420	0.9420	0.9421	0.9421
70							0.9433	0.9434	0.9434	0.9434
72							0.9445	0.9445	0.9445	0.9446
74							0.9455	0.9456	0.9456	0.9456

EQUATION: VM/V = B1 + B2*X3 + B3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1660 ; B3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 23.0 CM)

CROWN CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
26			0.3111	0.3125	0.3149	0.3168	0.3184	0.3196	0.3202	0.3225
28			0.4617	0.4628	0.4646	0.4660	0.4672	0.4682	0.4686	0.4703
30			0.5690	0.5698	0.5712	0.5723	0.5732	0.5740	0.5743	0.5756
32			0.6473	0.6480	0.6491	0.6499	0.6507	0.6512	0.6515	0.6526
34			0.7058	0.7063	0.7072	0.7079	0.7084	0.7089	0.7091	0.7100
36			0.7502	0.7507	0.7514	0.7519	0.7524	0.7528	0.7530	0.7537
38			0.7847	0.7850	0.7856	0.7861	0.7865	0.7868	0.7869	0.7875
40			0.8117	0.8120	0.8125	0.8129	0.8132	0.8135	0.8136	0.8141
42			0.8333	0.8336	0.8340	0.8343	0.8346	0.8348	0.8349	0.8353
44			0.8507	0.8509	0.8513	0.8516	0.8518	0.8520	0.8521	0.8524
46			0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
48			0.8767	0.8768	0.8771	0.8773	0.8775	0.8776	0.8777	0.8779
50				0.8866	0.8868	0.8870	0.8871	0.8872	0.8873	0.8875
52				0.8948	0.8950	0.8951	0.8952	0.8954	0.8954	0.8956
54				0.9017	0.9019	0.9020	0.9021	0.9022	0.9023	0.9024
56				0.9076	0.9078	0.9079	0.9080	0.9081	0.9081	0.9083
58						0.9130	0.9130	0.9131	0.9132	0.9133
60						0.9173	0.9174	0.9175	0.9175	0.9176
62						0.9211	0.9212	0.9213	0.9213	0.9214
64						0.9245	0.9245	0.9246	0.9246	0.9247
66							0.9274	0.9275	0.9275	0.9276
68							0.9300	0.9301	0.9301	0.9302
70							0.9323	0.9324	0.9324	0.9324
72							0.9343	0.9344	0.9344	0.9345
74							0.9362	0.9362	0.9362	0.9363

EQUATION: VM/V = B1 + B2*X3 + B3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1660 ; B3 = -0.7868

X3 = (T*T/(C*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; C = CROWN ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME

(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 27.0 CM)

CBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
30			0.2696	0.2711	0.2737	0.2757	0.2774	0.2787	0.2793	0.2818
32			0.4120	0.4132	0.4152	0.4168	0.4181	0.4191	0.4196	0.4215
34			0.5177	0.5187	0.5203	0.5215	0.5226	0.5234	0.5238	0.5253
36			0.5978	0.5985	0.5998	0.6009	0.6017	0.6024	0.6027	0.6039
38			0.6594	0.6601	0.6611	0.6619	0.6626	0.6632	0.6634	0.6645
40			0.7076	0.7081	0.7090	0.7097	0.7103	0.7108	0.7110	0.7119
42			0.7458	0.7463	0.7470	0.7476	0.7481	0.7485	0.7486	0.7493
44			0.7769	0.7769	0.7775	0.7780	0.7784	0.7788	0.7789	0.7795
46			0.8015	0.8018	0.8023	0.8027	0.8031	0.8034	0.8035	0.8040
48			0.8219	0.8222	0.8226	0.8230	0.8233	0.8235	0.8236	0.8241
50				0.8391	0.8395	0.8398	0.8400	0.8403	0.8404	0.8407
52				0.8532	0.8536	0.8538	0.8541	0.8542	0.8543	0.8547
54				0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
56				0.8752	0.8755	0.8757	0.8759	0.8760	0.8761	0.8763
58						0.8843	0.8844	0.8846	0.8846	0.8849
60						0.8917	0.8918	0.8919	0.8920	0.8922
62						0.8981	0.8982	0.8983	0.8983	0.8985
64						0.9036	0.9037	0.9038	0.9039	0.9040
66							0.9086	0.9087	0.9087	0.9089
68							0.9129	0.9129	0.9130	0.9131
70							0.9166	0.9167	0.9167	0.9169
72							0.9200	0.9201	0.9201	0.9202
74							0.9230	0.9230	0.9231	0.9232

EQUATION: VM/V = B1 + B2*X3 + B3*X3*X3

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; B1 = 0.9604 ; B2 = -0.1660 ; B3 = -0.7868

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

APPENDIX IV Stump Diameter Outside Bark Using Diameter Breast Height Outside Bark

SPECIES	PAGE
Eastern white pine (Pinus strobus L.)	84
Red pine (Pinus resinosa Ait.)	85
Jack pine (Pinus banksiana Lamb.)	86
Lodgepole pine (Pinus contorta Dougl. var. latifolia Engelm.)	87
Black spruce (Picea mariana (Mill.) B.S.P.)	88
Red spruce (Picea rubens Sarg.)	89
White spruce (Picea glauca (Moench) Voss.)	90
Balsam fir (Abies balsamea (L.) (Mill.))	91
Softwoods	92
Poplar spp. (Populus)	93
White birch (Betula papyrifera Marsh.)	94
Yellow birch (Betula alleghaniensis Britt.)	95
Hardwoods	96

STUMP DIAMETER OUTSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.7	2.6	2.5	2.5	2.4	2.4	2.3
4	5.4	5.2	5.1	5.0	4.9	4.7	4.6
6	8.1	7.8	7.6	7.5	7.3	7.1	6.9
8	10.9	10.4	10.2	10.0	9.7	9.4	9.2
10	13.6	13.0	12.7	12.5	12.1	11.8	11.5
12	16.3	15.6	15.3	15.0	14.5	14.1	13.8
14	19.0	18.2	17.8	17.5	16.9	16.5	16.1
16	21.7	20.7	20.3	20.0	19.4	18.8	18.4
18	24.4	23.3	22.9	22.5	21.8	21.2	20.7
20	27.1	25.9	25.4	25.0	24.2	23.6	23.0
22	29.9	28.5	28.0	27.5	26.6	25.9	25.3
24	32.6	31.1	30.5	30.0	29.0	28.3	27.6
26	35.3	33.7	33.1	32.5	31.5	30.6	29.9
28	38.0	36.3	35.6	35.0	33.9	33.0	32.2
30	40.7	38.9	38.1	37.5	36.3	35.3	34.5
32	43.4	41.5	40.7	40.0	38.7	37.7	36.8
34	46.1	44.1	43.2	42.5	41.2	40.0	39.1
36	48.9	46.7	45.8	45.0	43.6	42.4	41.4
38	51.6	49.3	48.3	47.5	46.0	44.7	43.7
40	54.3	51.9	50.9	50.0	48.4	47.1	46.0
42	57.0	54.5	53.4	52.5	50.9	49.5	48.3
44	59.7	57.0	55.9	55.0	53.3	51.8	50.6
46	62.4	59.6	58.5	57.5	55.7	54.2	52.9
48	65.1	62.2	61.0	60.0	58.1	56.5	55.2
50	67.9	64.8	63.6	62.5	60.5	58.9	57.5
52	70.6	67.4	66.1	65.0	62.9	61.2	59.8
54	73.3	70.0	68.7	67.5	65.4	63.6	62.1
56	76.0	72.6	71.2	70.0	67.8	65.9	64.4
58	78.7	75.2	73.7	72.4	70.2	68.3	66.7
60	81.4	77.8	76.3	74.9	72.6	70.7	69.0
62	84.1	80.4	78.8	77.4	75.0	73.0	71.3
64	86.9	83.0	81.4	79.9	77.5	75.4	73.5
66	89.6	85.6	83.9	82.4	79.9	77.7	75.8
68	92.3	88.2	86.5	84.9	82.3	80.1	78.1
70	95.0	90.8	89.0	87.4	84.7	82.4	80.4
72	97.7	93.3	91.5	89.9	87.1	84.8	82.7
74	100.4	95.9	94.1	92.4	89.6	87.1	85.0

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.216 ; B2 = 0.184

DATA SOURCE: 599 TREES FROM N.B., QUE., ONT.

STUMP DIAMETER OUTSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.2
4	5.2	5.0	4.9	4.8	4.7	4.6	4.5
6	7.8	7.5	7.3	7.2	7.0	6.9	6.7
8	10.4	10.0	9.8	9.6	9.4	9.2	9.0
10	12.9	12.4	12.2	12.1	11.7	11.5	11.2
12	15.5	14.9	14.7	14.5	14.1	13.8	13.5
14	18.1	17.4	17.1	16.9	16.4	16.1	15.7
16	20.7	19.9	19.6	19.3	18.8	18.3	18.0
18	23.3	22.4	22.0	21.7	21.1	20.6	20.2
20	25.9	24.9	24.5	24.1	23.5	22.9	22.5
22	28.5	27.4	26.9	26.5	25.8	25.2	24.7
24	31.1	29.9	29.4	28.9	28.2	27.5	27.0
26	33.7	32.4	31.8	31.3	30.5	29.8	29.2
28	36.3	34.9	34.3	33.8	32.9	32.1	31.4
30	38.8	37.3	36.7	36.2	35.2	34.4	33.7
32	41.4	39.8	39.2	38.6	37.6	36.7	35.9
34	44.0	42.3	41.6	41.0	39.9	39.0	38.2
36	46.6	44.8	44.1	43.4	42.3	41.3	40.4
38	49.2	47.3	46.5	45.8	44.6	43.6	42.7
40	51.8	49.8	49.0	48.2	46.9	45.9	44.9
42	54.4	52.3	51.4	50.6	49.3	48.2	47.2
44	57.0	54.8	53.9	53.0	51.6	50.5	49.4
46	59.6	57.3	56.3	55.5	54.0	52.7	51.7
48	62.2	59.7	58.8	57.9	56.3	55.0	53.9
50	64.7	62.2	61.2	60.3	58.7	57.3	56.2
52	67.3	64.7	63.7	62.7	61.0	59.6	58.4
54	69.9	67.2	66.1	65.1	63.4	61.9	60.7
56	72.5	69.7	68.5	67.5	65.7	64.2	62.9
58	75.1	72.2	71.0	69.9	68.1	66.5	65.1
60	77.7	74.7	73.4	72.3	70.4	68.8	67.4
62	80.3	77.2	75.9	74.7	72.8	71.1	69.6
64	82.9	79.7	78.3	77.2	75.1	73.4	71.9
66	85.5	82.1	80.8	79.6	77.5	75.7	74.1
68	88.1	84.6	83.2	82.0	79.8	78.0	76.4
70	90.6	87.1	85.7	84.4	82.2	80.3	78.6
72	93.2	89.6	88.1	86.8	84.5	82.6	80.9
74	95.8	92.1	90.6	89.2	86.9	84.9	83.1

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.178 ; B2 = 0.151

DATA SOURCE: 740 TREES FROM N.B., QUE., ONT.

STUMP DIAMETER OUTSIDE BARK (CM)

JACK PINE / PINUS BANKSIANA LAMB.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.2
4	5.2	5.0	4.9	4.8	4.7	4.6	4.5
6	7.7	7.5	7.3	7.2	7.0	6.9	6.7
8	10.3	9.9	9.8	9.6	9.4	9.2	9.0
10	12.9	12.4	12.2	12.0	11.7	11.4	11.2
12	15.5	14.9	14.7	14.4	14.1	13.7	13.5
14	18.1	17.4	17.1	16.8	16.4	16.0	15.7
16	20.7	19.9	19.5	19.3	18.7	18.3	17.9
18	23.2	22.4	22.0	21.7	21.1	20.6	20.2
20	25.8	24.8	24.4	24.1	23.4	22.9	22.4
22	28.4	27.3	26.9	26.5	25.8	25.2	24.7
24	31.0	29.8	29.3	28.9	28.1	27.5	26.9
26	33.6	32.3	31.8	31.3	30.5	29.8	29.2
28	36.2	34.8	34.2	33.7	32.8	32.1	31.4
30	38.7	37.3	36.6	36.1	35.1	34.3	33.7
32	41.3	39.7	39.1	38.5	37.5	36.6	35.9
34	43.9	42.2	41.5	40.9	39.8	38.9	38.1
36	46.5	44.7	44.0	43.3	42.2	41.2	40.4
38	49.1	47.2	46.4	45.7	44.5	43.5	42.6
40	51.7	49.7	48.9	48.1	46.9	45.8	44.9
42	54.2	52.2	51.3	50.5	49.2	48.1	47.1
44	56.8	54.6	53.7	52.9	51.6	50.4	49.4
46	59.4	57.1	56.2	55.3	53.9	52.7	51.6
48	62.0	59.6	58.6	57.8	56.2	55.0	53.8
50	64.6	62.1	61.1	60.2	58.6	57.2	56.1
52	67.2	64.6	63.5	62.6	60.9	59.5	58.3
54	69.7	67.1	66.0	65.0	63.3	61.8	60.6
56	72.3	69.5	68.4	67.4	65.6	64.1	62.8
58	74.9	72.0	70.8	69.8	68.0	66.4	65.1
60	77.5	74.5	73.3	72.2	70.3	68.7	67.3
62	80.1	77.0	75.7	74.6	72.6	71.0	69.5
64	82.7	79.5	78.2	77.0	75.0	73.3	71.8
66	85.2	82.0	80.6	79.4	77.3	75.6	74.0
68	87.8	84.4	83.1	81.8	79.7	77.9	76.3
70	90.4	86.9	85.5	84.2	82.0	80.1	78.5
72	93.0	89.4	87.9	86.6	84.4	82.4	80.8
74	95.6	91.9	90.4	89.0	86.7	84.7	83.0

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.176 ; B2 = 0.151

DATA SOURCE: 1472 TREES FROM QUE., ONT., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)

LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.4	2.4	2.3	2.3	2.3	2.2	2.2
4	4.9	4.7	4.7	4.6	4.5	4.4	4.4
6	7.3	7.1	7.0	6.9	6.8	6.6	6.5
8	9.7	9.4	9.3	9.2	9.0	8.9	8.7
10	12.2	11.8	11.6	11.5	11.3	11.1	10.9
12	14.6	14.1	14.0	13.8	13.5	13.3	13.1
14	17.0	16.5	16.3	16.1	15.8	15.5	15.3
16	19.4	18.9	18.6	18.4	18.0	17.7	17.4
18	21.9	21.2	20.9	20.7	20.2	19.9	19.6
20	24.3	23.6	23.3	23.0	22.5	22.1	21.8
22	26.7	25.9	25.6	25.3	24.8	24.4	24.0
24	29.2	28.3	27.9	27.6	27.0	26.6	26.2
26	31.6	30.6	30.3	29.9	29.3	28.8	28.3
28	34.0	33.0	32.6	32.2	31.5	31.0	30.5
30	36.5	35.4	34.9	34.5	33.8	33.2	32.7
32	38.9	37.7	37.2	36.8	36.1	35.4	34.9
34	41.3	40.1	39.6	39.1	38.3	37.6	37.1
36	43.8	42.4	41.9	41.4	40.6	39.8	39.2
38	46.2	44.8	44.2	43.7	42.9	42.1	41.4
40	48.6	47.1	46.5	46.0	45.1	44.3	43.6
42	51.0	49.5	48.9	48.3	47.3	46.5	45.8
44	53.5	51.9	51.2	50.6	49.6	48.7	47.9
46	55.9	54.2	53.5	52.9	51.8	50.9	50.1
48	58.3	56.6	55.9	55.2	54.1	53.1	52.3
50	60.8	58.9	58.2	57.5	56.3	55.3	54.5
52	63.2	61.3	60.5	59.8	58.6	57.6	56.7
54	65.6	63.6	62.8	62.1	60.8	59.8	58.9
56	68.1	66.0	65.2	64.4	63.1	62.0	61.0
58	70.5	68.4	67.5	66.7	65.3	64.2	63.2
60	72.9	70.7	69.8	69.0	67.6	66.4	65.4
62	75.4	73.1	72.1	71.3	69.9	68.6	67.6
64	77.8	75.4	74.5	73.6	72.1	70.8	69.7
66	80.2	77.8	76.8	75.9	74.4	73.1	71.9
68	82.6	80.1	79.1	78.2	76.6	75.3	74.1
70	85.1	82.5	81.4	80.5	78.9	77.5	76.3
72	87.5	84.9	83.8	82.8	81.1	79.7	78.5
74	89.9	87.2	86.1	85.1	83.4	81.9	80.6

EQUATION: DS = D(1-0.04365*B2)(1+B1*LOG(1.0764/(S+).3048)))
WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.130 ; B2 = 0.118

DATA SOURCE: 748 TREES FROM ALTA.

STUMP DIAMETER OUTSIDE BARK (CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.5	2.4	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.6	4.5
6	7.9	7.6	7.5	7.3	7.1	7.0	6.8
8	10.6	10.1	10.0	9.8	9.5	9.3	9.1
10	13.2	12.7	12.4	12.2	11.9	11.6	11.3
12	15.9	15.2	14.9	14.7	14.3	13.9	13.6
14	18.5	17.7	17.4	17.1	16.6	16.2	15.9
16	21.1	20.3	19.9	19.6	19.0	18.6	18.1
18	23.8	22.8	22.4	22.0	21.4	20.9	20.4
20	26.4	25.3	24.9	24.5	23.8	23.2	22.7
22	29.1	27.9	27.4	26.9	26.2	25.5	25.0
24	31.7	30.4	29.9	29.4	28.5	27.8	27.2
26	34.4	32.9	32.3	31.8	30.9	30.2	29.5
28	37.0	35.5	34.8	34.3	33.3	32.5	31.8
30	39.6	38.0	37.3	36.7	35.7	34.8	34.0
32	42.3	40.5	39.8	39.2	38.1	37.1	36.3
34	44.9	43.1	42.3	41.6	40.4	39.4	38.6
36	47.6	45.6	44.8	44.1	42.8	41.8	40.8
38	50.2	48.1	47.3	46.5	45.2	44.1	43.1
40	52.8	50.7	49.8	49.0	47.6	46.4	45.4
42	55.5	53.2	52.3	51.4	49.9	48.7	47.6
44	58.1	55.7	54.7	53.9	52.3	51.0	49.9
46	60.8	58.3	57.2	56.3	54.7	53.3	52.2
48	63.4	60.8	59.7	58.8	57.1	55.7	54.4
50	66.1	63.3	62.2	61.2	59.5	58.0	56.7
52	68.7	65.9	64.7	63.6	61.8	60.3	59.0
54	71.3	68.4	67.2	66.1	64.2	62.6	61.2
56	74.0	70.9	69.7	68.5	66.6	64.9	63.5
58	76.6	73.5	72.2	71.0	69.0	67.3	65.8
60	79.3	76.0	74.6	73.4	71.4	69.6	68.1
62	81.9	78.5	77.1	75.9	73.7	71.9	70.3
64	84.6	81.1	79.6	78.3	76.1	74.2	72.6
66	87.2	83.6	82.1	80.8	78.5	76.5	74.9
68	89.8	86.1	84.6	83.2	80.9	78.9	77.1
70	92.5	88.7	87.1	85.7	83.2	81.2	79.4
72	95.1	91.2	89.6	88.1	85.6	83.5	81.7
74	97.8	93.7	92.1	90.6	88.0	85.8	83.9

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$
WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.194 ; B2 = 0.164

DATA SOURCE: 723 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.7	2.6	2.5	2.5	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.7	4.6
6	8.0	7.7	7.5	7.4	7.2	7.0	6.8
8	10.7	10.2	10.0	9.9	9.6	9.3	9.1
10	13.3	12.8	12.5	12.3	12.0	11.7	11.4
12	16.0	15.3	15.0	14.8	14.4	14.0	13.7
14	18.7	17.9	17.5	17.2	16.7	16.3	15.9
16	21.3	20.4	20.0	19.7	19.1	18.6	18.2
18	24.0	23.0	22.6	22.2	21.5	21.0	20.5
20	26.7	25.5	25.1	24.6	23.9	23.3	22.8
22	29.3	28.1	27.6	27.1	26.3	25.6	25.1
24	32.0	30.6	30.1	29.6	28.7	28.0	27.3
26	34.7	33.2	32.6	32.0	31.1	30.3	29.6
28	37.3	35.7	35.1	34.5	33.5	32.6	31.9
30	40.0	38.3	37.6	37.0	35.9	35.0	34.2
32	42.6	40.8	40.1	39.4	38.3	37.3	36.4
34	45.3	43.4	42.6	41.9	40.7	39.6	38.7
36	48.0	45.9	45.1	44.4	43.1	42.0	41.0
38	50.6	48.5	47.6	46.8	45.4	44.3	43.3
40	53.3	51.0	50.1	49.3	47.8	46.6	45.6
42	56.0	53.6	52.6	51.7	50.2	49.0	47.8
44	58.6	56.2	55.1	54.2	52.6	51.3	50.1
46	61.3	58.7	57.6	56.7	55.0	53.6	52.4
48	64.0	61.3	60.1	59.1	57.4	55.9	54.7
50	66.6	63.8	62.6	61.6	59.8	58.3	57.0
52	69.3	66.4	65.2	64.1	62.2	60.6	59.2
54	72.0	68.9	67.7	66.5	64.6	62.9	61.5
56	74.6	71.5	70.2	69.0	67.0	65.3	63.8
58	77.3	74.0	72.7	71.5	69.4	67.6	66.1
60	80.0	76.6	75.2	73.9	71.8	69.9	68.3
62	82.6	79.1	77.7	76.4	74.2	72.3	70.6
64	85.3	81.7	80.2	78.9	76.5	74.6	72.9
66	88.0	84.2	82.7	81.3	78.9	76.9	75.2
68	90.6	86.8	85.2	83.8	81.3	79.3	77.5
70	93.3	89.3	87.7	86.2	83.7	81.6	79.7
72	96.0	91.9	90.2	88.7	86.1	83.9	82.0
74	98.6	94.4	92.7	91.2	88.5	86.2	84.3

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.201 ; B2 = 0.169

DATA SOURCE: 73 TREES FROM N.B.

STUMP DIAMETER OUTSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.7	2.6	2.5	2.5	2.4	2.3	2.3
4	5.4	5.1	5.0	5.0	4.8	4.7	4.6
6	8.0	7.7	7.6	7.4	7.2	7.0	6.9
8	10.7	10.3	10.1	9.9	9.6	9.4	9.1
10	13.4	12.8	12.6	12.4	12.0	11.7	11.4
12	16.1	15.4	15.1	14.9	14.4	14.0	13.7
14	18.8	18.0	17.6	17.3	16.8	16.4	16.0
16	21.5	20.5	20.1	19.8	19.2	18.7	18.3
18	24.1	23.1	22.7	22.3	21.6	21.0	20.6
20	26.8	25.7	25.2	24.8	24.0	23.4	22.8
22	29.5	28.2	27.7	27.2	26.4	25.7	25.1
24	32.2	30.8	30.2	29.7	28.8	28.1	27.4
26	34.9	33.4	32.7	32.2	31.2	30.4	29.7
28	37.5	35.9	35.3	34.7	33.6	32.7	32.0
30	40.2	38.5	37.8	37.1	36.0	35.1	34.3
32	42.9	41.0	40.3	39.6	38.4	37.4	36.6
34	45.6	43.6	42.8	42.1	40.8	39.8	38.8
36	48.3	46.2	45.3	44.6	43.2	42.1	41.1
38	51.0	48.7	47.8	47.0	45.6	44.4	43.4
40	53.6	51.3	50.4	49.5	48.0	46.8	45.7
42	56.3	53.9	52.9	52.0	50.4	49.1	48.0
44	59.0	56.4	55.4	54.5	52.8	51.5	50.3
46	61.7	59.0	57.9	56.9	55.2	53.8	52.5
48	64.4	61.6	60.4	59.4	57.6	56.1	54.8
50	67.0	64.1	62.9	61.9	60.0	58.5	57.1
52	69.7	66.7	65.5	64.4	62.4	60.8	59.4
54	72.4	69.3	68.0	66.8	64.8	63.1	61.7
56	75.1	71.8	70.5	69.3	67.2	65.5	64.0
58	77.8	74.4	73.0	71.8	69.6	67.8	66.3
60	80.4	77.0	75.5	74.3	72.0	70.2	68.5
62	83.1	79.5	78.1	76.7	74.4	72.5	70.8
64	85.8	82.1	80.6	79.2	76.8	74.8	73.1
66	88.5	84.7	83.1	81.7	79.2	77.2	75.4
68	91.2	87.2	85.6	84.2	81.6	79.5	77.7
70	93.9	89.8	88.1	86.6	84.1	81.9	80.0
72	96.5	92.4	90.6	89.1	86.5	84.2	82.2
74	99.2	94.9	93.2	91.6	88.9	86.5	84.5

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.206 ; B2 = 0.176

DATA SOURCE: 646 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.

STUMP DIAMETER OUTSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.2
4	5.2	5.0	4.9	4.8	4.7	4.6	4.5
6	7.7	7.5	7.3	7.2	7.0	6.9	6.7
8	10.3	9.9	9.8	9.6	9.4	9.2	9.0
10	12.9	12.4	12.2	12.0	11.7	11.4	11.2
12	15.5	14.9	14.7	14.4	14.1	13.7	13.5
14	18.1	17.4	17.1	16.8	16.4	16.0	15.7
16	20.7	19.9	19.5	19.3	18.7	18.3	17.9
18	23.2	22.4	22.0	21.7	21.1	20.6	20.2
20	25.8	24.8	24.4	24.1	23.4	22.9	22.4
22	28.4	27.3	26.9	26.5	25.8	25.2	24.7
24	31.0	29.8	29.3	28.9	28.1	27.5	26.9
26	33.6	32.3	31.8	31.3	30.5	29.8	29.2
28	36.2	34.8	34.2	33.7	32.8	32.1	31.4
30	38.7	37.3	36.6	36.1	35.1	34.3	33.6
32	41.3	39.7	39.1	38.5	37.5	36.6	35.9
34	43.9	42.2	41.5	40.9	39.8	38.9	38.1
36	46.5	44.7	44.0	43.3	42.2	41.2	40.4
38	49.1	47.2	46.4	45.7	44.5	43.5	42.6
40	51.7	49.7	48.9	48.1	46.9	45.8	44.9
42	54.2	52.2	51.3	50.5	49.2	48.1	47.1
44	56.8	54.6	53.7	52.9	51.6	50.4	49.4
46	59.4	57.1	56.2	55.3	53.9	52.7	51.6
48	62.0	59.6	58.6	57.8	56.2	55.0	53.8
50	64.6	62.1	61.1	60.2	58.6	57.2	56.1
52	67.2	64.6	63.5	62.6	60.9	59.5	58.3
54	69.7	67.1	66.0	65.0	63.3	61.8	60.6
56	72.3	69.5	68.4	67.4	65.6	64.1	62.8
58	74.9	72.0	70.8	69.8	68.0	66.4	65.1
60	77.5	74.5	73.3	72.2	70.3	68.7	67.3
62	80.1	77.0	75.7	74.6	72.6	71.0	69.5
64	82.7	79.5	78.2	77.0	75.0	73.3	71.8
66	85.2	82.0	80.6	79.4	77.3	75.6	74.0
68	87.8	84.4	83.1	81.8	79.7	77.9	76.3
70	90.4	86.9	85.5	84.2	82.0	80.1	78.5
72	93.0	89.4	87.9	86.6	84.4	82.4	80.8
74	95.6	91.9	90.4	89.0	86.7	84.7	83.0

EQUATION: DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))
WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.176 ; B2 = 0.182

DATA SOURCE: 355 TREES FROM NFLD., N.B., QUE., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)

SOFTWOODS

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.5	2.4	2.4	2.3	2.3
4	5.2	5.0	4.9	4.8	4.7	4.6	4.5
6	7.8	7.5	7.4	7.3	7.1	6.9	6.8
8	10.4	10.0	9.8	9.7	9.4	9.2	9.0
10	13.0	12.5	12.3	12.1	11.8	11.5	11.3
12	15.6	15.0	14.7	14.5	14.1	13.8	13.5
14	18.2	17.5	17.2	16.9	16.5	16.1	15.8
16	20.8	20.0	19.6	19.3	18.8	18.4	18.0
18	23.4	22.5	22.1	21.8	21.2	20.7	20.3
20	26.0	25.0	24.6	24.2	23.5	23.0	22.5
22	28.6	27.5	27.0	26.6	25.9	25.3	24.8
24	31.2	30.0	29.5	29.0	28.2	27.6	27.0
26	33.8	32.5	31.9	31.4	30.6	29.9	29.3
28	36.4	35.0	34.4	33.9	32.9	32.2	31.5
30	39.0	37.5	36.9	36.3	35.3	34.5	33.8
32	41.6	40.0	39.3	38.7	37.6	36.8	36.0
34	44.2	42.5	41.7	41.1	40.0	39.1	38.3
36	46.8	45.0	44.2	43.5	42.4	41.4	40.5
38	49.4	47.5	46.7	45.9	44.7	43.7	42.8
40	52.0	49.9	49.1	48.4	47.1	46.0	45.0
42	54.6	52.4	51.6	50.8	49.4	48.3	47.3
44	57.2	54.9	54.0	53.2	51.8	50.6	49.5
46	59.8	57.4	56.5	55.6	54.1	52.9	51.8
48	62.4	59.9	58.9	58.0	56.5	55.2	54.0
50	65.0	62.4	61.4	60.5	58.8	57.5	56.3
52	67.6	64.9	63.8	62.9	61.2	59.7	58.5
54	70.2	67.4	66.3	65.3	63.5	62.0	60.8
56	72.8	69.9	68.8	67.7	65.9	64.3	63.0
58	75.4	72.4	71.2	70.1	68.2	66.6	65.3
60	78.0	74.9	73.7	72.5	70.6	68.9	67.5
62	80.6	77.4	76.1	75.0	72.9	71.2	69.8
64	83.2	79.9	78.6	77.4	75.3	73.5	72.0
66	85.8	82.4	81.0	79.8	77.7	75.8	74.3
68	88.4	84.9	83.5	82.2	80.0	78.1	76.5
70	91.0	87.4	85.9	84.6	82.4	80.4	78.8
72	93.6	89.9	88.4	87.0	84.7	82.7	81.0
74	96.2	92.4	90.9	89.5	87.1	85.0	83.3

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.181 ; B2 = 0.155

DATA SOURCE: 5356 TREES FROM CENTRAL AND EASTERN CANADA

STUMP DIAMETER OUTSIDE BARK (CM)

POPLAR / POPULUS SPP.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.5	2.4	2.4	2.3	2.3	2.2	2.2
4	4.9	4.8	4.7	4.6	4.5	4.5	4.4
6	7.4	7.2	7.1	7.0	6.8	6.7	6.6
8	9.9	9.5	9.4	9.3	9.1	8.9	8.8
10	12.3	11.9	11.8	11.6	11.4	11.2	11.0
12	14.8	14.3	14.1	13.9	13.6	13.4	13.2
14	17.2	16.7	16.5	16.3	15.9	15.6	15.4
16	19.7	19.1	18.8	18.6	18.2	17.8	17.5
18	22.2	21.5	21.2	20.9	20.5	20.1	19.7
20	24.6	23.9	23.5	23.2	22.7	22.3	21.9
22	27.1	26.2	25.9	25.6	25.0	24.5	24.1
24	29.6	28.6	28.2	27.9	27.3	26.8	26.3
26	32.0	31.0	30.6	30.2	29.5	29.0	28.5
28	34.5	33.4	32.9	32.5	31.8	31.2	30.7
30	37.0	35.8	35.3	34.8	34.1	33.5	32.9
32	39.4	38.2	37.6	37.2	36.4	35.7	35.1
34	41.9	40.5	40.0	39.5	38.6	37.9	37.3
36	44.3	42.9	42.3	41.8	40.9	40.1	39.5
38	46.8	45.3	44.7	44.1	43.2	42.4	41.7
40	49.3	47.7	47.0	46.5	45.5	44.6	43.9
42	51.7	50.1	49.4	48.8	47.7	46.8	46.1
44	54.2	52.5	51.7	51.1	50.0	49.1	48.3
46	56.7	54.8	54.1	53.4	52.3	51.3	50.4
48	59.1	57.2	56.5	55.8	54.5	53.5	52.6
50	61.6	59.6	58.8	58.1	56.8	55.8	54.8
52	64.1	62.0	61.2	60.4	59.1	58.0	57.0
54	66.5	64.4	63.5	62.7	61.4	60.2	59.2
56	69.0	66.8	65.9	65.0	63.6	62.4	61.4
58	71.4	69.2	68.2	67.4	65.9	64.7	63.6
60	73.9	71.5	70.6	69.7	68.2	66.9	65.8
62	76.4	73.9	72.9	72.0	70.5	69.1	68.0
64	78.8	76.3	75.3	74.3	72.7	71.4	70.2
66	81.3	78.7	77.6	76.7	75.0	73.6	72.4
68	83.8	81.1	80.0	79.0	77.3	75.8	74.6
70	86.2	83.5	82.3	81.3	79.6	78.1	76.8
72	88.7	85.8	84.7	83.6	81.8	80.3	79.0
74	91.2	88.2	87.0	86.0	84.1	82.5	81.1

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$
WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.140 ; B2 = 0.127

DATA SOURCE: 541 TREES FROM QUE., ONT., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.5	2.5	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.6	4.5
6	7.9	7.6	7.5	7.4	7.1	7.0	6.8
8	10.6	10.1	10.0	9.8	9.5	9.3	9.1
10	13.2	12.7	12.5	12.3	11.9	11.6	11.4
12	15.9	15.2	15.0	14.7	14.3	13.9	13.6
14	18.5	17.8	17.4	17.2	16.7	16.3	15.9
16	21.2	20.3	19.9	19.6	19.0	18.6	18.2
18	23.8	22.8	22.4	22.1	21.4	20.9	20.4
20	26.5	25.4	24.9	24.5	23.8	23.2	22.7
22	29.1	27.9	27.4	27.0	26.2	25.5	25.0
24	31.8	30.4	29.9	29.4	28.6	27.9	27.2
26	34.4	33.0	32.4	31.9	31.0	30.2	29.5
28	37.1	35.5	34.9	34.3	33.3	32.5	31.8
30	39.7	38.1	37.4	36.8	35.7	34.9	34.1
32	42.4	40.6	39.9	39.2	38.1	37.1	36.3
34	45.0	43.1	42.4	41.7	40.5	39.5	38.6
36	47.7	45.7	44.9	44.1	42.9	41.8	40.9
38	50.3	48.2	47.3	46.6	45.2	44.1	43.1
40	53.0	50.7	49.8	49.0	47.6	46.4	45.4
42	55.6	53.3	52.3	51.5	50.0	48.8	47.7
44	58.3	55.8	54.8	53.9	52.4	51.1	49.9
46	60.9	58.4	57.3	56.4	54.8	53.4	52.2
48	63.5	60.9	59.8	58.8	57.1	55.7	54.5
50	66.2	63.4	62.3	61.3	59.5	58.0	56.8
52	68.8	66.0	64.8	63.7	61.9	60.4	59.0
54	71.5	68.5	67.3	66.2	64.3	62.7	61.3
56	74.1	71.0	69.8	68.6	66.7	65.0	63.6
58	76.8	73.6	72.3	71.1	69.1	67.3	65.8
60	79.4	76.1	74.8	73.5	71.4	69.7	68.1
62	82.1	78.7	77.3	76.0	73.8	72.0	70.4
64	84.7	81.2	79.7	78.4	76.2	74.3	72.6
66	87.4	83.7	82.2	80.9	78.6	76.6	74.9
68	90.0	86.3	84.7	83.4	81.0	78.9	77.2
70	92.7	88.8	87.2	85.8	83.3	81.3	79.5
72	95.3	91.3	89.7	88.3	85.7	83.6	81.7
74	98.0	93.9	92.2	90.7	88.1	85.9	84.0

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.196 ; B2 = 0.176

DATA SOURCE: 149 TREES FROM GUR.. ONT.. ALTA.

STUMP DIAMETER OUTSIDE BARK (CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.7	2.5	2.5	2.5	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.6	4.5
6	8.0	7.6	7.5	7.4	7.2	7.0	6.8
8	10.6	10.2	10.0	9.8	9.5	9.3	9.1
10	13.3	12.7	12.5	12.3	11.9	11.6	11.4
12	15.9	15.3	15.0	14.7	14.3	13.9	13.6
14	18.6	17.8	17.5	17.2	16.7	16.3	15.9
16	21.2	20.3	20.0	19.6	19.1	18.6	18.2
18	23.9	22.9	22.5	22.1	21.5	20.9	20.5
20	26.5	25.4	25.0	24.6	23.8	23.2	22.7
22	29.2	28.0	27.5	27.0	26.2	25.6	25.0
24	31.8	30.5	30.0	29.5	28.6	27.9	27.3
26	34.5	33.1	32.5	31.9	31.0	30.2	29.5
28	37.2	35.6	35.0	34.4	33.4	32.5	31.8
30	39.8	38.1	37.5	36.8	35.8	34.9	34.1
32	42.5	40.7	39.9	39.3	38.2	37.2	36.4
34	45.1	43.2	42.4	41.7	40.5	39.5	38.6
36	47.8	45.8	44.9	44.2	42.9	41.8	40.9
38	50.4	48.3	47.4	46.7	45.3	44.2	43.2
40	53.1	50.8	49.9	49.1	47.7	46.5	45.4
42	55.7	53.4	52.4	51.6	50.1	48.8	47.7
44	58.4	55.9	54.9	54.0	52.5	51.1	50.0
46	61.0	58.5	57.4	56.5	54.8	53.5	52.3
48	63.7	61.0	59.9	58.9	57.2	55.8	54.5
50	66.3	63.6	62.4	61.4	59.6	58.1	56.8
52	69.0	66.1	64.9	63.8	62.0	60.4	59.1
54	71.7	68.6	67.4	66.3	64.4	62.8	61.4
56	74.3	71.2	69.9	68.8	66.8	65.1	63.6
58	77.0	73.7	72.4	71.2	69.2	67.4	65.9
60	79.6	76.3	74.9	73.7	71.5	69.7	68.2
62	82.3	78.8	77.4	76.1	73.9	72.1	70.4
64	84.9	81.4	79.9	78.6	76.3	74.4	72.7
66	87.6	83.9	82.4	81.0	78.7	76.7	75.0
68	90.2	86.4	84.9	83.5	81.1	79.0	77.3
70	92.9	89.0	87.4	86.0	83.5	81.4	79.5
72	95.5	91.5	89.9	88.4	85.9	83.7	81.8
74	98.2	94.1	92.4	90.9	88.2	86.0	84.1

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.198 ; B2 = 0.181

DATA SOURCE: 151 TREES FROM QUE.. CNT.

STUMP DIAMETER OUTSIDE BARK (CM)

HARDWOODS

DBHOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.5	2.4	2.4	2.4	2.3	2.3	2.2
4	5.1	4.9	4.8	4.7	4.6	4.5	4.4
6	7.6	7.3	7.2	7.1	6.9	6.8	6.7
8	10.1	9.8	9.6	9.5	9.2	9.1	8.9
10	12.6	12.2	12.0	11.8	11.6	11.3	11.1
12	15.2	14.6	14.4	14.2	13.9	13.6	13.3
14	17.7	17.1	16.8	16.6	16.2	15.8	15.5
16	20.2	19.5	19.2	19.0	18.5	18.1	17.8
18	22.8	22.0	21.6	21.3	20.8	20.4	20.0
20	25.3	24.4	24.0	23.7	23.1	22.6	22.2
22	27.8	26.8	26.4	26.1	25.4	24.9	24.4
24	30.4	29.3	28.8	28.4	27.7	27.2	26.6
26	32.9	31.7	31.2	30.8	30.0	29.4	28.9
28	35.4	34.1	33.6	33.2	32.4	31.7	31.1
30	37.9	36.6	36.0	35.5	34.7	33.9	33.3
32	40.5	39.0	38.4	37.9	37.0	36.2	35.5
34	43.0	41.5	40.8	40.3	39.3	38.5	37.8
36	45.5	43.9	43.2	42.6	41.6	40.7	40.0
38	48.1	46.3	45.6	45.0	43.9	43.0	42.2
40	50.6	48.8	48.0	47.4	46.2	45.3	44.4
42	53.1	51.2	50.4	49.7	48.5	47.5	46.6
44	55.6	53.7	52.8	52.1	50.9	49.8	48.9
46	58.2	56.1	55.2	54.5	53.2	52.0	51.1
48	60.7	58.5	57.7	56.9	55.5	54.3	53.3
50	63.2	61.0	60.1	59.2	57.8	56.6	55.5
52	65.8	63.4	62.5	61.6	60.1	58.8	57.7
54	68.3	65.9	64.9	64.0	62.4	61.1	60.0
56	70.8	68.3	67.3	66.3	64.7	63.4	62.2
58	73.4	70.7	69.7	68.7	67.0	65.6	64.4
60	75.9	73.2	72.1	71.1	69.3	67.9	66.6
62	78.4	75.6	74.5	73.4	71.7	70.1	68.8
64	80.9	78.1	76.9	75.8	74.0	72.4	71.1
66	83.5	80.5	79.3	78.2	76.3	74.7	73.3
68	86.0	82.9	81.7	80.5	78.6	76.9	75.5
70	88.5	85.4	84.1	82.9	80.9	79.2	77.7
72	91.1	87.8	86.5	85.3	83.2	81.5	79.9
74	93.6	90.2	88.9	87.7	85.5	83.7	82.2

EQUATION: $DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))$

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B1 = 0.160 ; B2 = 0.145

DATA SOURCE: 341 TREES FROM QUE., ONT., MAN., SASK., ALTA.

APPENDIX V Diameter Breast Height Outside Bark Using Stump Diameter Outside Bark

SPECIES	PAGE
Eastern white pine (*Pinus strobus* L.)	98
Red pine (*Pinus resinosa* Ait.)	99
Jack pine (*Pinus banksiana* Lamb.)	100
Lodgepole pine (*Pinus contorta* Dougl. var. *latifolia* Engelm.)	101
Black spruce (*Picea mariana* (Mill.) B.S.P.)	102
Red spruce (*Picea rubens* Sarg.)	103
White spruce (*Picea glauca* (Moench) Voss.)	104
Balsam fir (*Abies balsamea* (L.) (Mill.))	105
Softwoods	106
Poplar spp. (*Populus*)	107
White birch (*Betula papyrifera* Marsh.)	108
Yellow birch (*Betula alleghaniensis* Britt.)	109
Hardwoods	110

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
8	3.5	3.7	3.8	3.9	4.1	4.2	4.4
10	6.9	7.4	7.7	7.9	8.2	8.5	8.7
12	10.4	11.2	11.5	11.8	12.3	12.7	13.1
20	13.8	14.9	15.3	15.7	16.4	16.9	17.4
22	15.2	16.4	16.9	17.3	18.0	18.6	19.2
24	16.6	17.9	18.4	18.9	19.7	20.3	20.9
26	18.0	19.4	19.9	20.4	21.3	22.0	22.7
28	19.4	20.8	21.5	22.0	22.9	23.7	24.4
30	20.8	22.3	23.0	23.6	24.6	25.4	26.2
32	22.1	23.8	24.5	25.1	26.2	27.1	27.9
34	23.5	25.3	26.0	26.7	27.8	28.8	29.6
36	24.9	26.8	27.6	28.3	29.5	30.5	31.4
38	26.3	28.3	29.1	29.8	31.1	32.2	33.1
40	27.7	29.8	30.6	31.4	32.8	33.9	34.9
42	29.1	31.3	32.2	33.0	34.4	35.6	36.6
44	30.4	32.8	33.7	34.6	36.0	37.3	38.4
46	31.8	34.2	35.2	36.1	37.7	39.0	40.1
48	33.2	35.7	36.8	37.7	39.3	40.7	41.9
50	34.6	37.2	38.3	39.3	40.9	42.4	43.6
52	36.0	38.7	39.8	40.8	42.6	44.1	45.3
54	37.4	40.2	41.4	42.4	44.2	45.8	47.1
56	38.7	41.7	42.9	44.0	45.9	47.5	48.8
58	40.1	43.2	44.4	45.6	47.5	49.1	50.6
60	41.5	44.7	46.0	47.1	49.1	50.8	52.3
62	42.9	46.2	47.5	48.7	50.8	52.5	54.1
64	44.3	47.6	49.0	50.3	52.4	54.2	55.8
66	45.7	49.1	50.6	51.8	54.1	55.9	57.6
68	47.0	50.6	52.1	53.4	55.7	57.6	59.3
70	48.4	52.1	53.6	55.0	57.3	59.3	61.0
72	49.8	53.6	55.2	56.6	59.0	61.0	62.8
74	51.2	55.1	56.7	58.1	60.6	62.7	64.5
76	52.6	56.6	58.2	59.7	62.2	64.4	66.3
78	54.0	58.1	59.8	61.3	63.9	66.1	68.0
80	55.4	59.6	61.3	62.8	65.5	67.8	69.8
82	56.7	61.1	62.8	64.4	67.2	69.5	71.5
84	58.1	62.5	64.4	66.0	68.8	71.2	73.2
86	59.5	64.0	65.9	67.5	70.4	72.9	75.0
88	60.9	65.5	67.4	69.1	72.1	74.6	76.7
90	62.3	67.0	69.0	70.7	73.7	76.3	78.5

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.184

DATA SOURCE: 599 TREES FROM N.B., QUE., ONT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	4.0	4.0	4.1	4.3	4.4	4.5
10	7.5	7.9	8.1	8.2	8.5	8.7	9.0
15	11.2	11.9	12.1	12.4	12.8	13.1	13.4
20	15.0	15.8	16.2	16.5	17.0	17.5	17.9
22	16.4	17.4	17.8	18.1	18.7	19.2	19.7
24	17.9	19.0	19.4	19.8	20.4	21.0	21.5
26	19.4	20.6	21.0	21.4	22.1	22.7	23.3
28	20.9	22.1	22.6	23.1	23.8	24.5	25.1
30	22.4	23.7	24.3	24.7	25.6	26.2	26.9
32	23.9	25.3	25.9	26.4	27.3	28.0	28.6
34	25.4	26.9	27.5	28.0	29.0	29.7	30.4
36	26.9	28.5	29.1	29.7	30.7	31.5	32.2
38	28.4	30.0	30.7	31.3	32.4	33.2	34.0
40	29.9	31.6	32.3	33.0	34.1	35.0	35.8
42	31.4	33.2	34.0	34.6	35.8	36.7	37.6
44	32.9	34.8	35.6	36.3	37.5	38.5	39.4
46	34.4	36.4	37.2	37.9	39.2	40.2	41.2
48	35.9	38.0	38.8	39.6	40.9	42.0	43.0
50	37.4	39.5	40.4	41.2	42.6	43.7	44.8
52	38.9	41.1	42.0	42.9	44.3	45.5	46.5
54	40.4	42.7	43.7	44.5	46.0	47.2	48.3
56	41.9	44.3	45.3	46.2	47.7	49.0	50.1
58	43.4	45.9	46.9	47.8	49.4	50.7	51.9
60	44.9	47.4	48.5	49.5	51.1	52.5	53.7
62	46.3	49.0	50.1	51.1	52.8	54.2	55.5
64	47.8	50.6	51.7	52.7	54.5	56.0	57.3
66	49.3	52.2	53.4	54.4	56.2	57.7	59.1
68	50.8	53.8	55.0	56.0	57.9	59.5	60.9
70	52.3	55.3	56.6	57.7	59.6	61.2	62.7
72	53.8	56.9	58.2	59.3	61.3	63.0	64.4
74	55.3	58.5	59.8	61.0	63.0	64.7	66.2
76	56.8	60.1	61.4	62.6	64.7	66.5	68.0
78	58.3	61.7	63.1	64.3	66.4	68.2	69.8
80	59.8	63.3	64.7	65.9	68.1	70.0	71.6
82	61.3	64.8	66.3	67.6	69.8	71.7	73.4
84	62.8	66.4	67.9	69.2	71.5	73.5	75.2
86	64.3	68.0	69.5	70.9	73.2	75.2	77.0
88	65.8	69.6	71.1	72.5	74.9	77.0	78.8
90	67.3	71.2	72.8	74.2	76.7	78.7	80.6

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.151

DATA SOURCE: 740 TREES FROM N.B.,QUE., ONT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

JACK PINE / PINUS BANKSIANA LAMB.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
8	3.7	4.0	4.0	4.1	4.3	4.4	4.5
10	7.5	7.9	8.1	8.2	8.5	8.7	9.0
15	11.2	11.9	12.1	12.4	12.8	13.1	13.4
20	15.0	15.8	16.2	16.5	17.0	17.5	17.9
22	16.4	17.4	17.3	18.1	18.7	19.2	19.7
24	17.9	19.0	19.4	19.8	20.4	21.0	21.5
26	19.4	20.6	21.0	21.4	22.1	22.7	23.3
28	20.9	22.1	22.6	23.1	23.8	24.5	25.1
30	22.4	23.7	24.3	24.7	25.6	26.2	26.9
32	23.9	25.3	25.9	26.4	27.3	28.0	28.6
34	25.4	26.9	27.5	28.0	29.0	29.7	30.4
36	26.9	28.5	29.1	29.7	30.7	31.5	32.2
38	28.4	30.0	30.7	31.3	32.4	33.2	34.0
40	29.9	31.6	32.3	33.0	34.1	35.0	35.8
42	31.4	33.2	34.0	34.6	35.8	36.7	37.6
44	32.9	34.8	35.6	36.3	37.5	38.5	39.4
46	34.4	36.4	37.2	37.9	39.2	40.2	41.2
48	35.9	38.0	38.8	39.6	40.9	42.0	43.0
50	37.4	39.5	40.4	41.2	42.6	43.7	44.8
52	38.9	41.1	42.0	42.9	44.3	45.5	46.5
54	40.4	42.7	43.7	44.5	46.0	47.2	48.3
56	41.9	44.3	45.3	46.2	47.7	49.0	50.1
58	43.4	45.9	46.9	47.8	49.4	50.7	51.9
60	44.9	47.4	48.5	49.5	51.1	52.5	53.7
62	46.3	49.0	50.1	51.1	52.8	54.2	55.5
64	47.8	50.6	51.7	52.7	54.5	56.0	57.3
66	49.3	52.2	53.4	54.4	56.2	57.7	59.1
68	50.8	53.8	55.0	56.0	57.9	59.5	60.9
70	52.3	55.3	56.6	57.7	59.6	61.2	62.7
72	53.8	56.9	58.2	59.3	61.3	63.0	64.4
74	55.3	58.5	59.8	61.0	63.0	64.7	66.2
76	56.8	60.1	61.4	62.6	64.7	66.5	68.0
78	58.3	61.7	63.1	64.3	66.4	68.2	69.8
80	59.8	63.3	64.7	65.9	68.1	70.0	71.6
82	61.3	64.8	66.3	67.6	69.8	71.7	73.4
84	62.8	66.4	67.9	69.2	71.5	73.5	75.2
86	64.3	68.0	69.5	70.9	73.2	75.2	77.0
88	65.8	69.6	71.1	72.5	74.9	77.0	78.8
90	67.3	71.2	72.8	74.2	76.7	78.7	80.6

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.151

DATA SOURCE: 1472 TREES FROM QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	4.0	4.2	4.3	4.3	4.4	4.5	4.6
10	8.0	8.4	8.5	8.6	8.8	9.0	9.2
15	12.0	12.5	12.8	12.9	13.3	13.5	13.8
20	16.1	16.7	17.0	17.3	17.7	18.0	18.4
22	17.7	18.4	18.7	19.0	19.5	19.8	20.2
24	19.3	20.1	20.4	20.7	21.2	21.7	22.0
26	20.9	21.8	22.1	22.4	23.0	23.5	23.9
28	22.5	23.4	23.8	24.2	24.8	25.3	25.7
30	24.1	25.1	25.5	25.9	26.5	27.1	27.5
32	25.7	26.8	27.2	27.6	28.3	28.9	29.4
34	27.3	28.4	28.9	29.3	30.1	30.7	31.2
36	28.9	30.1	30.6	31.1	31.8	32.5	33.1
38	30.5	31.8	32.3	32.8	33.6	34.3	34.9
40	32.1	33.5	34.0	34.5	35.4	36.1	36.7
42	33.7	35.1	35.7	36.2	37.1	37.9	38.6
44	35.3	36.8	37.4	38.0	38.9	39.7	40.4
46	36.9	38.5	39.1	39.7	40.7	41.5	42.2
48	38.5	40.2	40.8	41.4	42.4	43.3	44.1
50	40.1	41.8	42.5	43.1	44.2	45.1	45.9
52	41.8	43.5	44.2	44.9	46.0	46.9	47.7
54	43.4	45.2	45.9	46.6	47.7	48.7	49.6
56	45.0	46.9	47.6	48.3	49.5	50.5	51.4
58	46.6	48.5	49.3	50.0	51.3	52.3	53.3
60	48.2	50.2	51.0	51.8	53.1	54.1	55.1
62	49.8	51.9	52.7	53.5	54.8	55.9	56.9
64	51.4	53.5	54.4	55.2	56.6	57.8	58.8
66	53.0	55.2	56.1	56.9	58.4	59.6	60.6
68	54.6	56.9	57.8	58.7	60.1	61.4	62.4
70	56.2	58.6	59.5	60.4	61.9	63.2	64.3
72	57.8	60.2	61.2	62.1	63.7	65.0	66.1
74	59.4	61.9	62.9	63.8	65.4	66.8	67.9
76	61.0	63.6	64.6	65.6	67.2	68.6	69.8
78	62.6	65.3	66.3	67.3	69.0	70.4	71.6
80	64.2	66.9	68.0	69.0	70.7	72.2	73.5
82	65.8	68.6	69.7	70.8	72.5	74.0	75.3
84	67.4	70.3	71.4	72.5	74.3	75.8	77.1
86	69.1	72.0	73.1	74.2	76.0	77.6	79.0
88	70.7	73.6	74.8	75.9	77.8	79.4	80.8
90	72.3	75.3	76.5	77.7	79.6	81.2	82.6

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))$

WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.118

DATA SOURCE: 748 TREES FROM ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.6	3.9	4.0	4.0	4.2	4.3	4.4
10	7.3	7.7	7.9	8.1	8.4	8.6	8.9
15	10.9	11.6	11.9	12.1	12.6	13.0	13.3
20	14.5	15.4	15.8	16.2	16.8	17.3	17.7
22	16.0	17.0	17.4	17.8	18.5	19.0	19.5
24	17.4	18.5	19.0	19.4	20.1	20.7	21.3
26	18.9	20.1	20.6	21.0	21.9	22.5	23.0
28	20.3	21.6	22.2	22.7	23.5	24.2	24.8
30	21.8	23.2	23.8	24.3	25.2	25.9	26.6
32	23.2	24.7	25.3	25.9	26.8	27.7	28.4
34	24.7	26.3	26.9	27.5	28.5	29.4	30.1
36	26.1	27.8	28.5	29.1	30.2	31.1	31.9
38	27.6	29.4	30.1	30.7	31.9	32.8	33.7
40	29.0	30.9	31.7	32.4	33.6	34.6	35.4
42	30.5	32.4	33.3	34.0	35.2	36.3	37.2
44	31.9	34.0	34.8	35.6	36.9	38.0	39.0
46	33.4	35.5	36.4	37.2	38.6	39.7	40.8
48	34.8	37.1	38.0	38.8	40.3	41.5	42.5
50	36.3	38.6	39.6	40.4	41.9	43.2	44.3
52	37.7	40.2	41.2	42.1	43.6	44.9	46.1
54	39.2	41.7	42.8	43.7	45.3	46.7	47.8
56	40.6	43.3	44.3	45.3	47.0	48.4	49.6
58	42.1	44.8	45.9	46.9	48.7	50.1	51.4
60	43.5	46.3	47.5	48.5	50.3	51.8	53.2
62	45.0	47.9	49.1	50.2	52.0	53.6	54.9
64	46.4	49.4	50.7	51.8	53.7	55.3	56.7
66	47.9	51.0	52.3	53.4	55.4	57.0	58.5
68	49.3	52.5	53.8	55.0	57.0	58.8	60.2
70	50.8	54.1	55.4	56.6	58.7	60.5	62.0
72	52.2	55.6	57.0	58.2	60.4	62.2	63.8
74	53.7	57.2	58.6	59.9	62.1	63.9	65.6
76	55.1	58.7	60.2	61.5	63.7	65.7	67.3
78	56.6	60.3	61.8	63.1	65.4	67.4	69.1
80	58.0	61.8	63.3	64.7	67.1	69.1	70.9
82	59.5	63.3	64.9	66.3	68.8	70.9	72.7
84	61.0	64.9	66.5	68.0	70.5	72.6	74.4
86	62.4	66.4	68.1	69.6	72.1	74.3	76.2
88	63.9	68.0	69.7	71.2	73.8	76.0	78.0
90	65.3	69.5	71.3	72.8	75.5	77.8	79.7

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04765*B2))$

WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.164

DATA SOURCE: 723 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.6	3.8	3.9	4.0	4.2	4.3	4.4
10	7.2	7.7	7.9	8.0	8.3	8.6	8.8
15	10.8	11.5	11.8	12.0	12.5	12.9	13.2
20	14.3	15.3	15.7	16.1	16.7	17.2	17.6
22	15.8	16.8	17.3	17.7	18.3	18.9	19.4
24	17.2	18.4	18.8	19.3	20.0	20.6	21.2
26	18.6	19.9	20.4	20.9	21.7	22.4	22.9
28	20.1	21.4	22.0	22.5	23.3	24.1	24.7
30	21.5	23.0	23.6	24.1	25.0	25.8	26.5
32	23.0	24.5	25.1	25.7	26.7	27.5	28.2
34	24.4	26.0	26.7	27.3	28.4	29.2	30.0
36	25.8	27.6	28.3	28.9	30.0	31.0	31.8
38	27.3	29.1	29.8	30.5	31.7	32.7	33.5
40	28.7	30.6	31.4	32.1	33.4	34.4	35.3
42	30.1	32.2	33.0	33.7	35.0	36.1	37.1
44	31.6	33.7	34.6	35.3	36.7	37.8	38.8
46	33.0	35.2	36.1	36.9	38.4	39.6	40.6
48	34.4	36.7	37.7	38.5	40.0	41.3	42.4
50	35.9	38.3	39.3	40.2	41.7	43.0	44.1
52	37.3	39.8	40.8	41.8	43.4	44.7	45.9
54	38.7	41.3	42.4	43.4	45.0	46.4	47.7
56	40.2	42.9	44.0	45.0	46.7	48.2	49.4
58	41.6	44.4	45.5	46.6	48.4	49.9	51.2
60	43.0	45.9	47.1	48.2	50.0	51.6	52.9
62	44.5	47.5	48.7	49.8	51.7	53.3	54.7
64	45.9	49.0	50.3	51.4	53.4	55.0	56.5
66	47.3	50.5	51.8	53.0	55.0	56.8	58.2
68	48.8	52.1	53.4	54.6	56.7	58.5	60.0
70	50.2	53.6	55.0	56.2	58.4	60.2	61.8
72	51.6	55.1	56.5	57.8	60.0	61.9	63.5
74	53.1	56.6	58.1	59.4	61.7	63.6	65.3
76	54.5	58.2	59.7	61.0	63.4	65.4	67.1
78	55.9	59.7	61.3	62.6	65.0	67.1	68.8
80	57.4	61.2	62.8	64.2	66.7	68.8	70.6
82	58.8	62.8	64.4	65.9	68.4	70.5	72.4
84	60.2	64.3	66.0	67.5	70.0	72.2	74.1
86	61.7	65.8	67.5	69.1	71.7	74.0	75.9
88	63.1	67.4	69.1	70.7	73.4	75.7	77.7
90	64.5	68.9	70.7	72.3	75.0	77.4	79.4

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.169

DATA SOURCE: 73 TREES FROM N.B.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
8	3.5	3.8	3.9	4.0	4.1	4.3	4.4
10	7.1	7.6	7.8	7.9	8.3	8.5	8.8
15	10.6	11.3	11.6	11.9	12.4	12.8	13.2
20	14.1	15.1	15.5	15.9	16.5	17.1	17.6
22	15.5	16.6	17.1	17.5	18.2	18.8	19.3
24	16.9	18.1	18.6	19.1	19.8	20.5	21.1
26	18.3	19.6	20.2	20.7	21.5	22.2	22.8
28	19.8	21.2	21.7	22.3	23.2	23.9	24.6
30	21.2	22.7	23.3	23.8	24.8	25.6	26.3
32	22.6	24.2	24.8	25.4	26.5	27.3	28.1
34	24.0	25.7	26.4	27.0	28.1	29.0	29.8
36	25.4	27.2	27.9	28.6	29.8	30.7	31.6
38	26.8	28.7	29.5	30.2	31.4	32.5	33.3
40	28.2	30.2	31.1	31.8	33.1	34.2	35.1
42	29.6	31.7	32.6	33.4	34.7	35.9	36.9
44	31.0	33.3	34.2	35.0	36.4	37.6	38.6
46	32.4	34.8	35.7	36.6	38.0	39.3	40.4
48	33.9	36.3	37.3	38.2	39.7	41.0	42.1
50	35.3	37.8	38.8	39.7	41.3	42.7	43.9
52	36.7	39.3	40.4	41.3	43.0	44.4	45.6
54	38.1	40.8	41.9	42.9	44.7	46.1	47.4
56	39.5	42.3	43.5	44.5	46.3	47.8	49.1
58	40.9	43.8	45.0	46.1	48.0	49.5	50.9
60	42.3	45.3	46.6	47.7	49.6	51.2	52.7
62	43.7	46.9	48.1	49.3	51.3	53.0	54.4
64	45.1	48.4	49.7	50.9	52.9	54.7	56.2
66	46.6	49.9	51.2	52.5	54.6	56.4	57.9
68	48.0	51.4	52.8	54.1	56.2	58.1	59.7
70	49.4	52.9	54.3	55.6	57.9	59.8	61.4
72	50.8	54.4	55.9	57.2	59.5	61.5	63.2
74	52.2	55.9	57.5	58.8	61.2	63.2	64.9
76	53.6	57.4	59.0	60.4	62.8	64.9	66.7
78	55.0	58.9	60.6	62.0	64.5	66.6	68.5
80	56.4	60.5	62.1	63.6	66.2	68.3	70.2
82	57.8	62.0	63.7	65.2	67.8	70.0	72.0
84	59.3	63.5	65.2	66.8	69.5	71.7	73.7
86	60.7	65.0	66.8	68.4	71.1	73.4	75.5
88	62.1	66.5	68.3	69.9	72.8	75.2	77.2
90	63.5	68.0	69.9	71.5	74.4	76.9	79.0

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.176

DATA SOURCE: 646 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	3.9	4.0	4.1	4.3	4.4	4.5
10	7.5	7.9	8.1	8.2	8.5	8.7	8.9
15	11.2	11.8	12.1	12.3	12.9	13.1	13.4
20	14.9	15.8	16.1	16.5	17.0	17.5	17.9
22	16.4	17.4	17.8	18.1	18.7	19.2	19.7
24	17.9	18.9	19.4	19.8	20.4	21.0	21.5
26	19.4	20.5	21.0	21.4	22.1	22.7	23.3
28	20.9	22.1	22.6	23.0	23.8	24.5	25.0
30	22.4	23.7	24.2	24.7	25.5	26.2	26.8
32	23.9	25.3	25.8	26.3	27.2	28.0	28.6
34	25.4	26.8	27.4	28.0	28.9	29.7	30.4
36	26.8	28.4	29.1	29.6	30.6	31.5	32.2
38	28.3	30.0	30.7	31.3	32.3	33.2	34.0
40	29.8	31.6	32.3	32.9	34.0	35.0	35.8
42	31.3	33.1	33.9	34.6	35.7	36.7	37.6
44	32.8	34.7	35.5	36.2	37.4	38.5	39.4
46	34.3	36.3	37.1	37.9	39.1	40.2	41.1
48	35.8	37.9	38.7	39.5	40.8	42.0	42.9
50	37.3	39.5	40.4	41.2	42.5	43.7	44.7
52	38.8	41.0	42.0	42.8	44.2	45.5	46.5
54	40.3	42.6	43.6	44.4	45.9	47.2	48.3
56	41.8	44.2	45.2	46.1	47.6	48.9	50.1
58	43.3	45.8	46.8	47.7	49.3	50.7	51.9
60	44.7	47.4	48.4	49.4	51.0	52.4	53.7
62	46.2	48.9	50.0	51.0	52.7	54.2	55.5
64	47.7	50.5	51.7	52.7	54.4	55.9	57.2
66	49.2	52.1	53.3	54.3	56.1	57.7	59.0
68	50.7	53.7	54.9	56.0	57.8	59.4	60.8
70	52.2	55.2	56.5	57.6	59.5	61.2	62.6
72	53.7	56.8	58.1	59.3	61.2	62.9	64.4
74	55.2	58.4	59.7	60.9	63.0	64.7	66.2
76	56.7	60.0	61.3	62.5	64.7	66.4	68.0
78	58.2	61.6	63.0	64.2	66.4	68.2	69.8
80	59.7	63.1	64.6	65.8	68.1	69.9	71.6
82	61.2	64.7	66.2	67.5	69.8	71.7	73.3
84	62.6	66.3	67.8	69.1	71.5	73.4	75.1
86	64.1	67.9	69.4	70.8	73.2	75.2	76.9
88	65.6	69.5	71.0	72.4	74.9	76.9	78.7
90	67.1	71.0	72.6	74.1	76.6	78.7	80.5

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DOHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.152

DATA SOURCE: 355 TREES FROM NFLD.,N.B., QUE., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

SOFTWOODS

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	3.9	4.0	4.1	4.2	4.4	4.5
10	7.4	7.9	8.0	8.2	8.5	8.7	8.9
15	11.1	11.8	12.0	12.3	12.7	13.1	13.4
20	14.8	15.7	16.1	16.4	17.0	17.4	17.8
22	16.3	17.3	17.7	18.0	18.6	19.2	19.6
24	17.8	18.8	19.3	19.7	20.3	20.9	21.4
26	19.3	20.4	20.9	21.3	22.0	22.7	23.2
28	20.7	22.0	22.5	22.9	23.7	24.4	25.0
30	22.2	23.6	24.1	24.6	25.4	26.1	26.8
32	23.7	25.1	25.7	26.2	27.1	27.9	28.6
34	25.2	26.7	27.3	27.9	28.8	29.6	30.3
36	26.7	28.3	28.9	29.5	30.5	31.4	32.1
38	28.1	29.8	30.5	31.1	32.2	33.1	33.9
40	29.6	31.4	32.1	32.8	33.9	34.9	35.7
42	31.1	33.0	33.7	34.4	35.6	36.6	37.5
44	32.6	34.5	35.3	36.1	37.3	38.3	39.3
46	34.1	36.1	36.9	37.7	39.0	40.1	41.0
48	35.6	37.7	38.6	39.3	40.7	41.8	42.8
50	37.0	39.3	40.2	41.0	42.4	43.6	44.6
52	38.5	40.8	41.8	42.6	44.1	45.3	46.4
54	40.0	42.4	43.4	44.3	45.8	47.1	48.2
56	41.5	44.0	45.0	45.9	47.5	48.8	50.0
58	43.0	45.5	46.6	47.5	49.2	50.6	51.8
60	44.4	47.1	48.2	49.2	50.9	52.3	53.5
62	45.9	48.7	49.8	50.8	52.6	54.0	55.3
64	47.4	50.2	51.4	52.4	54.3	55.8	57.1
66	48.9	51.8	53.0	54.1	55.9	57.5	58.9
68	50.4	53.4	54.6	55.7	57.6	59.3	60.7
70	51.9	55.0	56.2	57.4	59.3	61.0	62.5
72	53.3	56.5	57.8	59.0	61.0	62.8	64.2
74	54.8	58.1	59.4	60.6	62.7	64.5	66.0
76	56.3	59.7	61.0	62.3	64.4	66.2	67.8
78	57.8	61.2	62.7	63.9	66.1	68.0	69.6
80	59.3	62.8	64.3	65.6	67.8	69.7	71.4
82	60.7	64.4	65.9	67.2	69.5	71.5	73.2
84	62.2	65.9	67.5	68.8	71.2	73.2	75.0
86	63.7	67.5	69.1	70.5	72.9	75.0	76.7
88	65.2	69.1	70.7	72.1	74.6	76.7	78.5
90	66.7	70.7	72.3	73.8	76.3	78.4	80.3

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))$

WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.155

DATA SOURCE: 5356 TREES FROM CENTRAL AND EASTERN CANADA

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

POPLAR / POPULUS SPP.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
8	3.9	4.1	4.2	4.3	4.4	4.5	4.6
10	7.9	8.2	8.4	8.5	8.8	8.9	9.1
18	11.8	12.4	12.6	12.8	13.1	13.4	13.7
20	15.8	16.5	16.8	17.0	17.5	17.9	18.2
22	17.3	18.1	18.5	18.8	19.3	19.7	20.1
24	18.9	19.8	20.1	20.5	21.0	21.5	21.9
26	20.5	21.4	21.8	22.2	22.8	23.3	23.7
28	22.1	23.1	23.5	23.9	24.5	25.1	25.5
30	23.6	24.7	25.2	25.6	26.3	26.8	27.4
32	25.2	26.4	26.8	27.3	28.0	28.6	29.2
34	26.8	28.0	28.5	29.0	29.8	30.4	31.0
36	28.4	29.7	30.2	30.7	31.5	32.2	32.8
38	29.9	31.3	31.9	32.4	33.3	34.0	34.7
40	31.5	33.0	33.6	34.1	35.0	35.8	36.5
42	33.1	34.6	35.2	35.8	36.8	37.6	38.3
44	34.7	36.3	36.9	37.5	38.5	39.4	40.1
46	36.2	37.9	38.6	39.2	40.3	41.2	41.9
48	37.8	39.6	40.3	40.9	42.0	43.0	43.8
50	39.4	41.2	41.9	42.6	43.8	44.7	45.6
52	41.0	42.9	43.6	44.3	45.5	46.5	47.4
54	42.5	44.5	45.3	46.0	47.3	48.3	49.2
56	44.1	46.1	47.0	47.7	49.0	50.1	51.1
58	45.7	47.8	48.7	49.4	50.8	51.9	52.9
60	47.3	49.4	50.3	51.1	52.5	53.7	54.7
62	48.8	51.1	52.0	52.8	54.3	55.5	56.5
64	50.4	52.7	53.7	54.5	56.0	57.3	58.4
66	52.0	54.4	55.4	56.3	57.8	59.1	60.2
68	53.6	56.0	57.1	58.0	59.5	60.9	62.0
70	55.2	57.7	58.7	59.7	61.3	62.6	63.8
72	56.7	59.3	60.4	61.4	63.0	64.4	65.7
74	58.3	61.0	62.1	63.1	64.8	66.2	67.5
76	59.9	62.6	63.8	64.8	66.5	68.0	69.3
78	61.5	64.3	65.4	66.5	68.3	69.8	71.1
80	63.0	65.9	67.1	68.2	70.0	71.6	72.9
82	64.6	67.6	68.8	69.9	71.8	73.4	74.8
84	66.2	69.2	70.5	71.6	73.5	75.2	76.6
86	67.8	70.9	72.2	73.3	75.3	77.0	78.4
88	69.3	72.5	73.8	75.0	77.0	78.8	80.2
90	70.9	74.2	75.5	76.7	78.8	80.5	82.1

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))$

WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.127

DATA SOURCE: 541 TREES FROM QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.5	3.8	3.9	4.0	4.1	4.3	4.4
10	7.1	7.6	7.8	7.9	8.3	8.5	8.8
15	10.6	11.3	11.6	11.9	12.4	12.8	13.2
20	14.1	15.1	15.5	15.9	16.5	17.1	17.6
22	15.5	16.6	17.1	17.5	18.2	18.8	19.3
24	16.9	18.1	18.6	19.1	19.8	20.5	21.1
26	18.3	19.6	20.2	20.7	21.5	22.2	22.8
28	19.8	21.2	21.7	22.3	23.2	23.9	24.6
30	21.2	22.7	23.3	23.8	24.8	25.6	26.3
32	22.6	24.2	24.8	25.4	26.5	27.3	28.1
34	24.0	25.7	26.4	27.0	28.1	29.0	29.8
36	25.4	27.2	27.9	28.6	29.8	30.7	31.6
38	26.8	28.7	29.5	30.2	31.4	32.5	33.3
40	28.2	30.2	31.1	31.8	33.1	34.2	35.1
42	29.6	31.7	32.6	33.4	34.7	35.9	36.9
44	31.0	33.3	34.2	35.0	36.4	37.6	38.6
46	32.4	34.8	35.7	36.6	38.0	39.3	40.4
48	33.9	36.3	37.3	38.2	39.7	41.0	42.1
50	35.3	37.8	38.8	39.7	41.3	42.7	43.9
52	36.7	39.3	40.4	41.3	43.0	44.4	45.6
54	38.1	40.8	41.9	42.9	44.7	46.1	47.4
56	39.5	42.3	43.5	44.5	46.3	47.8	49.1
58	40.9	43.8	45.0	46.1	48.0	49.5	50.9
60	42.3	45.3	46.6	47.7	49.6	51.2	52.7
62	43.7	46.9	48.1	49.3	51.3	53.0	54.4
64	45.1	48.4	49.7	50.9	52.9	54.7	56.2
66	46.6	49.9	51.2	52.5	54.6	56.4	57.9
68	48.0	51.4	52.8	54.1	56.2	58.1	59.7
70	49.4	52.9	54.3	55.6	57.9	59.8	61.4
72	50.8	54.4	55.9	57.2	59.3	61.5	63.2
74	52.2	55.9	57.5	58.8	61.2	63.2	64.9
76	53.6	57.4	59.0	60.4	62.8	64.9	66.7
78	55.0	58.9	60.6	62.0	64.5	66.6	68.5
80	56.4	60.5	62.1	63.6	66.2	68.3	70.2
82	57.8	62.0	63.7	65.2	67.8	70.0	72.0
84	59.3	63.5	65.2	66.8	69.5	71.7	73.7
86	60.7	65.0	66.8	68.4	71.1	73.4	75.5
88	62.1	66.5	68.3	69.9	72.8	75.2	77.2
90	63.5	68.0	69.9	71.5	74.4	76.9	79.0

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.043E5*B2))$

WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.176

DATA SOURCE: 149 TREES FROM CUE.. CNT.. ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.5	3.7	3.8	3.9	4.1	4.2	4.4
10	7.0	7.5	7.7	7.9	8.2	8.5	8.7
18	10.5	11.2	11.5	11.8	12.3	12.7	13.1
20	13.9	15.0	15.4	15.8	16.4	17.0	17.5
22	15.3	16.5	16.9	17.4	18.1	18.7	19.2
24	16.7	18.0	18.5	18.9	19.7	20.4	21.0
26	18.1	19.5	20.0	20.5	21.4	22.1	22.7
28	19.5	21.0	21.6	22.1	23.0	23.8	24.5
30	20.9	22.5	23.1	23.7	24.7	25.5	26.2
32	22.3	24.0	24.6	25.2	26.3	27.2	28.0
34	23.7	25.5	26.2	26.8	27.9	28.9	29.7
36	25.1	27.0	27.7	28.4	29.6	30.6	31.5
38	26.5	28.5	29.3	30.0	31.2	32.3	33.2
40	27.9	29.9	30.8	31.6	32.9	34.0	35.0
42	29.3	31.4	32.3	33.1	34.5	35.7	36.7
44	30.7	32.9	33.9	34.7	36.2	37.4	38.5
46	32.1	34.4	35.4	36.3	37.8	39.1	40.2
48	33.5	35.9	37.0	37.9	39.5	40.8	42.0
50	34.8	37.4	38.5	39.4	41.1	42.5	43.7
52	36.2	38.9	40.0	41.0	42.7	44.2	45.5
54	37.6	40.4	41.6	42.6	44.4	45.9	47.2
56	39.0	41.9	43.1	44.2	46.0	47.6	48.9
58	40.4	43.4	44.7	45.8	47.7	49.3	50.7
60	41.8	44.9	46.2	47.3	49.3	51.0	52.4
62	43.2	46.4	47.7	48.9	51.0	52.7	54.2
64	44.6	47.9	49.3	50.5	52.6	54.4	55.9
66	46.0	49.4	50.8	52.1	54.2	56.1	57.7
68	47.4	50.9	52.4	53.7	55.9	57.8	59.4
70	48.8	52.4	53.9	55.2	57.5	59.5	61.2
72	50.2	53.9	55.4	56.8	59.2	61.2	62.9
74	51.6	55.4	57.0	58.4	60.8	62.9	64.7
76	53.0	56.9	58.5	60.0	62.5	64.6	66.4
78	54.4	58.4	60.1	61.5	64.1	66.3	68.2
80	55.8	59.9	61.6	63.1	65.8	68.0	69.9
82	57.1	61.4	63.1	64.7	67.4	69.7	71.7
84	58.5	62.9	64.7	66.3	69.0	71.4	73.4
86	59.9	64.4	66.2	67.9	70.7	73.1	75.2
88	61.3	65.9	67.8	69.4	72.3	74.8	76.9
90	62.7	67.4	69.3	71.0	74.0	76.5	78.7

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))$

WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.181

DATA SOURCE: 151 TREES FROM GUE.. ONT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

HARDWOODS

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.8	4.0	4.1	4.2	4.3	4.4	4.5
10	7.6	8.0	8.2	8.3	8.6	8.8	9.0
15	11.4	12.0	12.2	12.5	12.9	13.2	13.5
20	15.2	16.0	16.3	16.6	17.2	17.6	18.0
22	16.7	17.6	18.0	18.3	18.9	19.4	19.8
24	18.2	19.2	19.6	19.9	20.6	21.1	21.6
26	19.7	20.8	21.2	21.6	22.3	22.9	23.4
28	21.2	22.4	22.8	23.3	24.0	24.6	25.2
30	22.7	24.0	24.5	24.9	25.7	26.4	27.0
32	24.2	25.6	26.1	26.6	27.4	28.2	28.8
34	25.8	27.2	27.7	28.3	29.2	29.9	30.6
36	27.3	28.8	29.4	29.9	30.9	31.7	32.4
38	28.8	30.4	31.0	31.6	32.6	33.4	34.2
40	30.3	32.0	32.6	33.2	34.3	35.2	36.0
42	31.8	33.6	34.3	34.9	36.0	37.0	37.8
44	33.3	35.2	35.9	36.6	37.7	38.7	39.6
46	34.8	36.8	37.5	38.2	39.4	40.5	41.4
48	36.4	38.4	39.2	39.9	41.2	42.2	43.2
50	37.9	40.0	40.8	41.6	42.9	44.0	45.0
52	39.4	41.5	42.4	43.2	44.6	45.8	46.8
54	40.9	43.1	44.1	44.9	46.3	47.5	48.6
56	42.4	44.7	45.7	46.5	48.0	49.3	50.4
58	43.9	46.3	47.3	48.2	49.7	51.0	52.2
60	45.5	47.9	49.0	49.9	51.5	52.8	54.0
62	47.0	49.5	50.6	51.5	53.2	54.6	55.8
64	48.5	51.1	52.2	53.2	54.9	56.3	57.6
66	50.0	52.7	53.9	54.9	56.6	58.1	59.4
68	51.5	54.3	55.5	56.5	58.3	59.8	61.2
70	53.0	55.9	57.1	58.2	60.0	61.6	63.0
72	54.5	57.5	58.8	59.8	61.7	63.4	64.7
74	56.1	59.1	60.4	61.5	63.5	65.1	66.5
76	57.6	60.7	62.0	63.2	65.2	66.9	68.3
78	59.1	62.3	63.6	64.8	66.9	68.6	70.1
80	60.6	63.9	65.3	66.5	68.6	70.4	71.9
82	62.1	65.5	66.9	68.2	70.3	72.2	73.7
84	63.6	67.1	68.5	69.8	72.0	73.9	75.5
86	65.2	68.7	70.2	71.5	73.8	75.7	77.3
88	66.7	70.3	71.8	73.1	75.5	77.4	79.1
90	68.2	71.9	73.4	74.8	77.2	79.2	80.9

EQUATION: D = DS((1+B2*LOG((S+0.3048)/1.6764))/(1-0.04365*B2))
WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.145

DATA SOURCE: 841 TREES FROM QUE., ONT., MAN., SASK., ALTA.

APPENDIX VI Stump Diameter Inside Bark Using Diameter Breast Height Outside Bark

SPECIES	PAGE
Eastern white pine (*Pinus strobus* L.)	112
Red pine (*Pinus resinosa* Ait.)	113
Jack pine (*Pinus banksiana* Lamb.)	114
Lodgepole pine (*Pinus contorta* Dougl. var. *latifolia* Engelm.)	115
Black spruce (*Picea mariana* (Mill.) B.S.P.)	116
Red spruce (*Picea rubens* Sarg.)	117
White spruce (*Picea glauca* (Moench) Voss.)	118
Balsam fir (*Abies balsamea* (L.) (Mill.))	119
Softwoods	120
Poplar spp. (*Populus*)	121
White birch (*Betula papyrifera* Marsh.)	122
Yellow birch (*Betula alleghaniensis* Britt.)	123
Hardwoods	124

STUMP DIAMETER INSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.5	2.4	2.3	2.3	2.2	2.2	2.1	1.9
4	4.9	4.7	4.6	4.6	4.4	4.3	4.2	3.7
6	7.4	7.1	6.9	6.8	6.6	6.5	6.3	5.5
8	9.8	9.4	9.3	9.1	8.8	8.6	8.4	7.4
10	12.3	11.8	11.6	11.4	11.0	10.7	10.5	9.2
12	14.8	14.1	13.9	13.6	13.2	12.9	12.6	11.0
14	17.2	16.5	16.2	15.9	15.4	15.0	14.7	12.9
16	19.7	18.8	18.5	18.2	17.6	17.2	16.8	14.7
18	22.1	21.2	20.8	20.4	19.8	19.3	18.9	16.5
20	24.6	23.5	23.1	22.7	22.0	21.4	20.9	18.4
22	27.0	25.9	25.4	25.0	24.2	23.6	23.0	20.2
24	29.5	28.2	27.7	27.2	26.4	25.7	25.1	22.0
26	31.9	30.6	30.0	29.5	28.6	27.9	27.2	23.9
28	34.4	32.9	32.3	31.7	30.8	30.0	29.3	25.7
30	36.8	35.2	34.6	34.0	33.0	32.1	31.4	27.5
32	39.3	37.6	36.9	36.3	35.2	34.3	33.5	29.4
34	41.7	39.9	39.2	38.5	37.4	36.4	35.6	31.2
36	44.2	42.3	41.5	40.8	39.6	38.6	37.7	33.0
38	46.6	44.6	43.8	43.1	41.8	40.7	39.8	34.9
40	49.1	47.0	46.1	45.3	44.0	42.8	41.9	36.7
42	51.6	49.3	48.4	47.6	46.2	45.0	43.9	38.5
44	54.0	51.7	50.7	49.9	48.4	47.1	46.0	40.4
46	56.5	54.0	53.0	52.1	50.6	49.3	48.1	42.2
48	58.9	56.4	55.3	54.4	52.8	51.4	50.2	44.0
50	61.4	58.7	57.6	56.7	55.0	53.5	52.3	45.9
52	63.8	61.1	59.9	58.9	57.2	55.7	54.4	47.7
54	66.3	63.4	62.2	61.2	59.4	57.8	56.5	49.5
56	68.7	65.8	64.5	63.5	61.6	60.0	58.6	51.4
58	71.2	68.1	66.8	65.7	63.8	62.1	60.7	53.2
60	73.6	70.5	69.2	68.0	66.0	64.3	62.8	55.0
62	76.1	72.8	71.5	70.2	68.2	66.4	64.9	56.9
64	78.5	75.1	73.8	72.5	70.4	68.5	66.9	58.7
66	81.0	77.5	76.1	74.8	72.6	70.7	69.0	60.5
68	83.4	79.8	78.4	77.0	74.8	72.8	71.1	62.4
70	85.9	82.2	80.7	79.3	76.9	75.0	73.2	64.2
72	88.3	84.5	83.0	81.6	79.1	77.1	75.3	66.0
74	90.8	86.9	85.3	83.8	81.3	79.2	77.4	67.9

EQUATION: DSI = B3+D(1-0.04365*B2)(B4+B5*LOG(1.0764/(S+0.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.184 ; B3 = 0.936 ; B4 = 0.916 ; B5 = 0.188

DATA SOURCE: 1158 TREES FROM N.B., QUE., ONT.

STUMP DIAMETER INSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.0
4	4.8	4.7	4.6	4.5	4.4	4.3	4.3	3.8
6	7.1	6.9	6.8	6.7	6.5	6.4	6.3	5.7
8	9.5	9.1	9.0	8.9	8.7	8.5	8.3	7.5
10	11.8	11.4	11.2	11.0	10.8	10.5	10.3	9.3
12	14.1	13.6	13.4	13.2	12.9	12.6	12.4	11.2
14	16.4	15.8	15.6	15.4	15.0	14.7	14.4	13.0
16	18.7	18.1	17.8	17.5	17.1	16.7	16.4	14.8
18	21.0	20.3	20.0	19.7	19.2	18.8	18.5	16.6
20	23.3	22.5	22.2	21.9	21.3	20.9	20.5	18.5
22	25.7	24.7	24.4	24.0	23.4	23.0	22.5	20.3
24	28.0	27.0	26.6	26.2	25.6	25.0	24.6	22.1
26	30.3	29.2	28.8	28.4	27.7	27.1	26.6	23.9
28	32.6	31.4	31.0	30.5	29.8	29.2	28.6	25.9
30	34.9	33.7	33.2	32.7	31.9	31.2	30.6	27.6
32	37.2	35.9	35.4	34.9	34.0	33.3	32.7	29.4
34	39.6	38.1	37.6	37.0	36.1	35.4	34.7	31.3
36	41.9	40.4	39.8	39.2	38.2	37.4	36.7	33.1
38	44.2	42.6	41.9	41.4	40.4	39.5	38.8	34.9
40	46.5	44.8	44.1	43.5	42.5	41.6	40.8	36.7
42	48.8	47.1	46.3	45.7	44.6	43.6	42.8	38.6
44	51.1	49.3	48.5	47.9	46.7	45.7	44.9	40.4
46	53.4	51.5	50.7	50.0	48.8	47.8	46.9	42.2
48	55.8	53.8	52.9	52.2	50.9	49.8	48.9	44.0
50	58.1	56.0	55.1	54.4	53.0	51.9	50.9	45.9
52	60.4	58.2	57.3	56.5	55.2	54.0	53.0	47.7
54	62.7	60.5	59.5	58.7	57.3	56.1	55.0	49.5
56	65.0	62.7	61.7	60.9	59.4	58.1	57.0	51.3
58	67.3	64.9	63.9	63.0	61.5	60.2	59.1	53.2
60	69.7	67.2	66.1	65.2	63.6	62.3	61.1	55.0
62	72.0	69.4	68.3	67.4	65.7	64.3	63.1	56.8
64	74.3	71.6	70.5	69.5	67.8	66.4	65.1	58.7
66	76.6	73.8	72.7	71.7	69.9	68.5	67.2	60.5
68	78.9	76.1	74.9	73.9	72.1	70.5	69.2	62.3
70	81.2	78.3	77.1	76.0	74.2	72.6	71.2	64.1
72	83.5	80.5	79.3	78.2	76.3	74.7	73.3	66.0
74	85.9	82.8	81.5	80.4	78.4	76.7	75.3	67.8

EQUATION: DSI = B3+D(1-0.04365*B2)(B4+B5*LOG(1.6764/(S+0.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.151 ; B3 = 0.196 ; B4 = 0.913 ; B5 = 0.148

DATA SOURCE: 1480 TREES FROM N.B.,QUE., ONT.

STUMP DIAMETER INSIDE BARK (CM)

JACK PINE / PINUS BANKSIANA LAMB.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	1.9	1.8	1.8	1.7	1.7	1.7	1.6	1.5
4	4.2	4.0	3.9	3.9	3.8	3.7	3.6	3.4
6	6.5	6.3	6.2	6.1	6.0	5.9	5.8	5.3
8	8.8	8.5	8.4	8.3	8.1	8.0	7.9	7.2
10	11.1	10.8	10.6	10.5	10.3	10.1	10.0	9.1
12	13.4	13.0	12.8	12.7	12.4	12.2	12.0	11.1
14	15.7	15.2	15.1	14.9	14.6	14.3	14.1	13.0
16	18.0	17.5	17.3	17.1	16.7	16.4	16.2	14.9
18	20.3	19.7	19.5	19.3	18.9	18.6	18.3	16.8
20	22.6	22.0	21.7	21.5	21.0	20.7	20.4	18.7
22	24.9	24.2	23.9	23.6	23.2	22.8	22.4	20.7
24	27.3	26.5	26.1	25.8	25.3	24.9	24.5	22.6
26	29.6	28.7	28.3	28.0	27.5	27.0	26.6	24.5
28	31.9	30.9	30.6	30.2	29.6	29.1	28.7	26.4
30	34.2	33.2	32.8	32.4	31.8	31.2	30.8	28.3
32	36.5	35.4	35.0	34.6	33.9	33.3	32.8	30.3
34	38.8	37.7	37.2	36.8	36.1	35.5	34.9	32.2
36	41.1	39.9	39.4	39.0	38.2	37.6	37.0	34.1
38	43.4	42.2	41.6	41.2	40.4	39.7	39.1	36.0
40	45.7	44.4	43.8	43.4	42.5	41.8	41.2	37.9
42	48.0	46.6	46.1	45.6	44.7	43.9	43.3	39.9
44	50.3	48.9	48.3	47.7	46.8	46.0	45.3	41.8
46	52.7	51.1	50.5	49.9	49.0	48.1	47.4	43.7
48	55.0	53.4	52.7	52.1	51.1	50.2	49.5	45.6
50	57.3	55.6	54.9	54.3	53.3	52.4	51.6	47.5
52	59.6	57.8	57.1	56.5	55.4	54.5	53.7	49.5
54	61.9	60.1	59.4	58.7	57.6	56.6	55.7	51.4
56	64.2	62.3	61.6	60.9	59.7	58.7	57.8	53.3
58	66.5	64.6	63.8	63.1	61.8	60.8	59.9	55.2
60	68.8	66.8	66.0	65.3	64.0	62.9	62.0	57.1
62	71.1	69.1	68.2	67.5	66.1	65.0	64.1	59.1
64	73.4	71.3	70.4	69.6	68.3	67.1	66.1	61.0
66	75.7	73.5	72.6	71.8	70.4	69.3	68.2	62.9
68	78.1	75.8	74.9	74.0	72.6	71.4	70.3	64.8
70	80.4	78.0	77.1	76.2	74.7	73.5	72.4	66.7
72	82.7	80.3	79.3	78.4	76.9	75.6	74.5	68.6
74	85.0	82.5	81.5	80.6	79.0	77.7	76.6	70.6

EQUATION: DSI = B3+C(1-C.04365*B2)(B4+B5*LOG(1.6764/(S+C.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.151 ; B3 = -0.455 ; B4 = C.961 ; B5 = 0.119

DATA SOURCE: 2944 TREES FROM ONE., ONT., MAN., SASK.

STUMP DIAMETER INSIDE BARK (CM)

LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.6
4	4.3	4.2	4.1	4.1	4.0	3.9	3.9	3.5
6	6.6	6.4	6.3	6.2	6.1	6.0	5.9	5.5
8	8.9	8.6	8.5	8.4	8.3	8.1	8.0	7.4
10	11.2	10.9	10.8	10.6	10.4	10.3	10.1	9.3
12	13.5	13.1	13.0	12.8	12.6	12.4	12.2	11.3
14	15.8	15.4	15.2	15.0	14.7	14.5	14.3	13.2
16	18.1	17.6	17.4	17.2	16.9	16.6	16.4	15.1
18	20.4	19.9	19.6	19.4	19.0	18.7	18.5	17.0
20	22.7	22.1	21.8	21.6	21.2	20.8	20.5	19.0
22	25.1	24.4	24.1	23.8	23.3	23.0	22.6	20.9
24	27.4	26.6	26.3	26.0	25.5	25.1	24.7	22.8
26	29.7	28.8	28.5	28.2	27.7	27.2	26.8	24.8
28	32.0	31.1	30.7	30.4	29.8	29.3	28.9	26.7
30	34.3	33.3	32.9	32.6	32.0	31.4	31.0	28.6
32	36.6	35.6	35.1	34.8	34.1	33.6	33.1	30.6
34	38.9	37.8	37.4	37.0	36.3	35.7	35.2	32.5
36	41.2	40.1	39.6	39.2	38.4	37.8	37.3	34.4
38	43.5	42.3	41.8	41.4	40.6	39.9	39.3	36.4
40	45.8	44.5	44.0	43.5	42.7	42.0	41.4	38.3
42	48.1	46.8	46.2	45.7	44.9	44.2	43.5	40.2
44	50.5	49.0	48.5	47.9	47.0	46.3	45.6	42.2
46	52.8	51.3	50.7	50.1	49.2	48.4	47.7	44.1
48	55.1	53.5	52.9	52.3	51.3	50.5	49.8	46.0
50	57.4	55.8	55.1	54.5	53.5	52.6	51.9	48.0
52	59.7	58.0	57.3	56.7	55.6	54.7	54.0	49.9
54	62.0	60.3	59.5	58.9	57.8	56.9	56.1	51.8
56	64.3	62.5	61.8	61.1	60.0	59.0	58.1	53.8
58	66.6	64.7	64.0	63.3	62.1	61.1	60.2	55.7
60	68.9	67.0	66.2	65.5	64.3	63.2	62.3	57.6
62	71.2	69.2	68.4	67.7	66.4	65.3	64.4	59.6
64	73.5	71.5	70.6	69.9	68.6	67.5	66.5	61.5
66	75.9	73.7	72.9	72.1	70.7	69.6	68.6	63.4
68	78.2	76.0	75.1	74.3	72.9	71.7	70.7	65.3
70	80.5	78.2	77.3	76.5	75.0	73.8	72.8	67.3
72	82.8	80.5	79.5	78.7	77.2	75.9	74.8	69.2
74	85.1	82.7	81.7	80.9	79.3	78.0	76.9	71.1

EQUATION: DSI = B3+D(1-0.04365*B2)(B4+B5*LOG(1.6764/(S+0.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.118 ; B3 = -0.338 ; B4 = 0.966 ; B5 = 0.114

DATA SOURCE: 2110 TREES FROM ALTA.

STUMP DIAMETER INSIDE BARK (CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.5
4	4.5	4.3	4.2	4.2	4.0	3.9	3.8	3.4
6	7.0	6.7	6.6	6.5	6.3	6.1	6.0	5.3
8	9.5	9.1	8.9	8.8	8.5	8.3	8.2	7.2
10	11.9	11.5	11.3	11.1	10.8	10.5	10.3	9.2
12	14.4	13.9	13.6	13.4	13.1	12.8	12.5	11.1
14	16.9	16.3	16.0	15.7	15.3	15.0	14.6	13.0
16	19.4	18.6	18.3	18.1	17.6	17.2	16.8	15.0
18	21.9	21.0	20.7	20.4	19.8	19.4	19.0	16.9
20	24.4	23.4	23.0	22.7	22.1	21.6	21.1	18.8
22	26.9	25.8	25.4	25.0	24.3	23.8	23.3	20.8
24	29.3	28.2	27.7	27.3	26.6	26.0	25.5	22.7
26	31.8	30.6	30.1	29.6	28.9	28.2	27.6	24.6
28	34.3	33.0	32.4	32.0	31.1	30.4	29.8	26.6
30	36.8	35.4	34.8	34.3	33.4	32.6	31.9	28.5
32	39.3	37.8	37.1	36.6	35.6	34.8	34.1	30.4
34	41.8	40.2	39.5	38.9	37.9	37.0	36.3	32.3
36	44.2	42.5	41.8	41.2	40.1	39.2	38.4	34.3
38	46.7	44.9	44.2	43.5	42.4	41.4	40.6	36.2
40	49.2	47.3	46.5	45.9	44.6	43.6	42.7	38.1
42	51.7	49.7	48.9	48.2	46.9	45.8	44.9	40.1
44	54.2	52.1	51.3	50.5	49.2	48.0	47.1	42.0
46	56.7	54.5	53.6	52.8	51.4	50.2	49.2	43.9
48	59.2	56.9	56.0	55.1	53.7	52.4	51.4	45.9
50	61.6	59.3	58.3	57.4	55.9	54.7	53.5	47.8
52	64.1	61.7	60.7	59.8	58.2	56.9	55.7	49.7
54	66.6	64.1	63.0	62.1	60.4	59.1	57.9	51.7
56	69.1	66.4	65.4	64.4	62.7	61.3	60.0	53.6
58	71.6	68.8	67.7	66.7	65.0	63.6	62.2	55.5
60	74.1	71.2	70.1	69.0	67.2	65.7	64.4	57.4
62	76.6	73.6	72.4	71.3	69.5	67.9	66.5	59.4
64	79.0	76.0	74.8	73.7	71.7	70.1	68.7	61.3
66	81.5	78.4	77.1	76.0	74.0	72.3	70.8	63.2
68	84.0	80.8	79.5	78.3	76.2	74.5	73.0	65.2
70	86.5	83.2	81.8	80.6	78.5	76.7	75.2	67.1
72	89.0	85.6	84.2	82.9	80.7	78.9	77.3	69.0
74	91.5	88.0	86.5	85.2	83.0	81.1	79.5	71.0

EQUATION: DSI = B3+D(1-C.C4365*E2)(B4+B5*LOG(1.6764/(S+C.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.164 ; B3 = -0.478 ; B4 = C.965 ; B5 = 0.168

DATA SOURCE: 1766 TREES FROM NFLD.. N.B.. QUE.. ONT.. MAN..SASK.

STUMP DIAMETER INSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.7
4	4.9	4.7	4.6	4.5	4.4	4.3	4.2	3.6
6	7.5	7.1	7.0	6.9	6.7	6.5	6.3	5.5
8	10.0	9.6	9.4	9.2	8.9	8.7	8.5	7.4
10	12.5	12.0	11.8	11.6	11.2	10.9	10.7	9.4
12	15.1	14.4	14.2	13.9	13.5	13.2	12.9	11.3
14	17.6	16.9	16.6	16.3	15.8	15.4	15.0	13.2
16	20.2	19.3	18.9	18.6	18.1	17.6	17.2	15.1
18	22.7	21.7	21.3	21.0	20.4	19.8	19.4	17.0
20	25.3	24.2	23.7	23.3	22.6	22.1	21.5	18.9
22	27.8	26.6	26.1	25.7	24.9	24.3	23.7	20.8
24	30.4	29.1	28.5	28.0	27.2	26.5	25.9	22.7
26	32.9	31.5	30.9	30.4	29.5	28.7	28.1	24.6
28	35.4	33.9	33.3	32.7	31.8	31.0	30.2	26.5
30	38.0	36.4	35.7	35.1	34.1	33.2	32.4	28.4
32	40.5	38.8	38.1	37.4	36.3	35.4	34.6	30.4
34	43.1	41.2	40.5	39.8	38.6	37.6	36.8	32.3
36	45.6	43.7	42.9	42.1	40.9	39.8	38.9	34.2
38	48.2	46.1	45.3	44.5	43.2	42.1	41.1	36.1
40	50.7	48.5	47.7	46.9	45.5	44.3	43.3	38.0
42	53.3	51.0	50.0	49.2	47.7	46.5	45.5	39.9
44	55.8	53.4	52.4	51.6	50.0	48.7	47.6	41.8
46	58.4	55.9	54.8	53.9	52.3	51.0	49.8	43.7
48	60.9	58.3	57.2	56.3	54.6	53.2	52.0	45.6
50	63.4	60.7	59.6	58.6	56.9	55.4	54.1	47.5
52	66.0	63.2	62.0	61.0	59.2	57.6	56.3	49.4
54	68.5	65.6	64.4	63.3	61.4	59.9	58.5	51.3
56	71.1	68.0	66.8	65.7	63.7	62.1	60.7	53.3
58	73.6	70.5	69.2	68.0	66.0	64.3	62.8	55.2
60	76.2	72.9	71.6	70.4	68.3	66.6	65.0	57.1
62	78.7	75.3	74.0	72.7	70.6	68.8	67.2	59.0
64	81.3	77.8	76.4	75.1	72.9	71.0	69.4	60.9
66	83.8	80.2	78.7	77.4	75.1	73.2	71.5	62.8
68	86.3	82.7	81.1	79.8	77.4	75.4	73.7	64.7
70	88.9	85.1	83.5	82.1	79.7	77.7	75.9	66.6
72	91.4	87.5	85.9	84.5	82.0	79.9	78.0	68.5
74	94.0	90.0	88.3	86.8	84.3	82.1	80.2	70.4

EQUATION: DSI = B3+D(1-C.C4365*B2)(B4+B5*LOG(1.6764/(S+C.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.169 ; B3 = -0.185 ; B4 = C.953 ; B5 = C.193

DATA SOURCE: 146 TREES FROM N.B.

STUMP DIAMETER INSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	1.8	1.6	1.6	1.6	1.5	1.4	1.4	1.1
4	4.3	4.1	4.0	4.0	3.8	3.7	3.6	3.1
6	6.9	6.6	6.5	6.4	6.2	6.0	5.8	5.1
8	9.5	9.1	8.9	8.8	8.5	8.3	8.1	7.0
10	12.1	11.6	11.4	11.2	10.8	10.6	10.3	9.0
12	14.7	14.1	13.8	13.6	13.2	12.8	12.5	11.0
14	17.3	16.6	16.3	16.0	15.5	15.1	14.8	12.9
16	19.9	19.1	18.7	18.4	17.9	17.4	17.0	14.9
18	22.5	21.6	21.2	20.8	20.2	19.7	19.2	16.9
20	25.1	24.0	23.6	23.2	22.5	22.0	21.5	18.9
22	27.7	26.5	26.0	25.6	24.9	24.2	23.7	20.8
24	30.3	29.0	28.5	28.0	27.2	26.5	25.9	22.8
26	32.9	31.5	30.9	30.4	29.5	28.8	28.1	24.8
28	35.5	34.0	33.4	32.8	31.9	31.1	30.4	26.7
30	38.1	36.5	35.8	35.2	34.2	33.4	32.6	28.7
32	40.7	39.0	38.3	37.6	36.6	35.6	34.8	30.7
34	43.3	41.5	40.7	40.0	38.9	37.9	37.1	32.6
36	45.9	44.0	43.2	42.5	41.2	40.2	39.3	34.6
38	48.5	46.4	45.6	44.9	43.6	42.5	41.5	36.6
40	51.1	48.9	48.1	47.3	45.9	44.7	43.7	38.5
42	53.7	51.4	50.5	49.7	48.2	47.0	46.0	40.5
44	56.3	53.9	52.9	52.1	50.6	49.3	48.2	42.5
46	58.9	56.4	55.4	54.5	52.9	51.6	50.4	44.5
48	61.5	58.9	57.8	56.9	55.3	53.9	52.7	46.4
50	64.0	61.4	60.3	59.3	57.6	56.1	54.9	48.4
52	66.6	63.9	62.7	61.7	59.9	58.4	57.1	50.4
54	69.2	66.4	65.2	64.1	62.3	60.7	59.4	52.3
56	71.8	68.8	67.6	66.5	64.6	63.0	61.6	54.3
58	74.4	71.3	70.1	68.9	66.9	65.3	63.8	56.3
60	77.0	73.8	72.5	71.3	69.3	67.5	66.0	58.2
62	79.6	76.3	74.9	73.7	71.6	69.8	68.3	60.2
64	82.2	78.8	77.4	76.1	74.0	72.1	70.5	62.2
66	84.8	81.3	79.8	78.5	76.3	74.4	72.7	64.1
68	87.4	83.8	82.3	80.9	78.6	76.7	75.0	66.1
70	90.0	86.3	84.7	83.3	81.0	78.9	77.2	68.1
72	92.6	88.8	87.2	85.8	83.3	81.2	79.4	70.1
74	95.2	91.2	89.6	88.2	85.6	83.5	81.7	72.0

EQUATION: DSI = B3+D(1-C.04365*E2)(B4+B5*LOG(1.6764/(S+0.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.176 ; B3 = -0.843 ; B4 = 0.984 ; B5 = 0.190

DATA SOURCE: 1252 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.

STUMP DIAMETER INSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.6
4	4.3	4.2	4.1	4.1	4.0	3.9	3.9	3.5
6	6.7	6.5	6.4	6.3	6.2	6.1	6.0	5.4
8	9.0	8.7	8.6	8.5	8.3	8.2	8.1	7.4
10	11.4	11.0	10.9	10.7	10.5	10.3	10.1	9.3
12	13.7	13.3	13.1	13.0	12.7	12.4	12.2	11.2
14	16.1	15.6	15.3	15.2	14.8	14.6	14.3	13.1
16	18.4	17.8	17.6	17.4	17.0	16.7	16.4	15.0
18	20.7	20.1	19.8	19.6	19.2	18.8	18.5	17.0
20	23.1	22.4	22.1	21.8	21.4	21.0	20.6	18.9
22	25.4	24.6	24.3	24.0	23.5	23.1	22.7	20.8
24	27.8	26.9	26.6	26.2	25.7	25.2	24.8	22.7
26	30.1	29.2	28.8	28.4	27.9	27.4	26.9	24.7
28	32.4	31.4	31.0	30.7	30.0	29.5	29.0	26.6
30	34.8	33.7	33.3	32.9	32.2	31.6	31.1	28.5
32	37.1	36.0	35.5	35.1	34.4	33.7	33.2	30.4
34	39.5	38.3	37.8	37.3	36.5	35.9	35.3	32.3
36	41.8	40.5	40.0	39.5	38.7	38.0	37.4	34.3
38	44.2	42.8	42.2	41.7	40.9	40.1	39.5	36.2
40	46.5	45.1	44.5	43.9	43.0	42.3	41.6	39.1
42	48.8	47.3	46.7	46.2	45.2	44.4	43.7	40.0
44	51.2	49.6	49.0	48.4	47.4	46.5	45.8	42.0
46	53.5	51.9	51.2	50.6	49.5	48.7	47.9	43.9
48	55.9	54.1	53.4	52.8	51.7	50.8	50.0	45.8
50	58.2	56.4	55.7	55.0	53.9	52.9	52.1	47.7
52	60.5	58.7	57.9	57.2	56.0	55.0	54.2	49.6
54	62.9	61.0	60.2	59.4	58.2	57.2	56.3	51.6
56	65.2	63.2	62.4	61.7	60.4	59.3	58.4	53.5
58	67.6	65.5	64.6	63.9	62.6	61.4	60.5	55.4
60	69.9	67.8	66.9	66.1	64.7	63.6	62.6	57.3
62	72.2	70.0	69.1	68.3	66.9	65.7	64.7	59.2
64	74.6	72.3	71.4	70.5	69.1	67.8	66.8	61.2
66	76.9	74.6	73.6	72.7	71.2	70.0	68.9	63.1
68	79.3	76.8	75.9	74.9	73.4	72.1	70.9	65.0
70	81.6	79.1	78.1	77.2	75.6	74.2	73.0	66.9
72	84.0	81.4	80.3	79.4	77.7	76.3	75.1	68.9
74	86.3	83.6	82.6	81.6	79.9	78.5	77.2	70.9

EQUATION: DSI = B3+D(1-C.04365*E2)(B4+B5*LOG(1.6764/(S+C.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.152 ; B3 = -0.333 ; B4 = 0.962 ; B5 = C.127

DATA SOURCE: 2316 TREES FROM NFLD.,N.B., QUE., MAN., SASK.

STUMP DIAMETER INSIDE BARK (CM)

SOFTWOODS

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.1	2.0	1.9	1.9	1.9	1.8	1.8	1.6
4	4.4	4.3	4.2	4.2	4.0	4.0	3.9	3.5
6	6.8	6.6	6.5	6.4	6.2	6.1	6.0	5.4
8	9.2	8.9	8.8	8.6	8.4	8.2	8.1	7.3
10	11.6	11.2	11.0	10.9	10.6	10.4	10.2	9.2
12	14.0	13.5	13.3	13.1	12.8	12.5	12.3	11.1
14	16.4	15.8	15.6	15.4	15.0	14.7	14.4	13.0
16	18.8	18.1	17.8	17.6	17.2	16.8	16.5	14.9
18	21.2	20.4	20.1	19.8	19.4	19.0	18.6	16.8
20	23.5	22.7	22.4	22.1	21.6	21.1	20.7	18.7
22	25.9	25.0	24.7	24.3	23.7	23.3	22.8	20.6
24	28.3	27.3	26.9	26.6	25.9	25.4	24.9	22.5
26	30.7	29.6	29.2	28.8	28.1	27.5	27.0	24.4
28	33.1	31.9	31.5	31.0	30.3	29.7	29.2	26.3
30	35.5	34.2	33.7	33.3	32.5	31.8	31.3	28.3
32	37.9	36.6	36.0	35.5	34.7	34.0	33.4	30.2
34	40.3	38.9	38.3	37.8	36.9	36.1	35.5	32.1
36	42.6	41.2	40.6	40.0	39.1	38.3	37.6	34.0
38	45.0	43.5	42.8	42.3	41.3	40.4	39.7	35.9
40	47.4	45.8	45.1	44.5	43.4	42.6	41.8	37.8
42	49.8	48.1	47.4	46.7	45.6	44.7	43.9	39.7
44	52.2	50.4	49.6	49.0	47.8	46.8	46.0	41.6
46	54.6	52.7	51.9	51.2	50.0	49.0	48.1	43.5
48	57.0	55.0	54.2	53.5	52.2	51.1	50.2	45.4
50	59.4	57.3	56.5	55.7	54.4	53.3	52.3	47.3
52	61.7	59.6	58.7	57.9	56.6	55.4	54.4	49.2
54	64.1	61.9	61.0	60.2	58.8	57.6	56.5	51.1
56	66.5	64.2	63.3	62.4	61.0	59.7	58.6	53.0
58	68.9	66.5	65.5	64.7	63.1	61.9	60.7	54.9
60	71.3	68.8	67.8	66.9	65.3	64.0	62.8	56.8
62	73.7	71.1	70.1	69.1	67.5	66.1	65.0	58.7
64	76.1	73.4	72.4	71.4	69.7	68.3	67.1	60.7
66	78.5	75.7	74.6	73.6	71.9	70.4	69.2	62.6
68	80.8	78.0	76.9	75.9	74.1	72.6	71.3	64.5
70	83.2	80.4	79.2	78.1	76.3	74.7	73.4	66.4
72	85.6	82.7	81.4	80.4	78.5	76.9	75.5	68.3
74	88.0	85.0	83.7	82.6	80.7	79.0	77.6	70.2

EQUATION: DSI = B3+D(1-0.04365*B2)(B4+B5*LOG(1.6764/(S+0.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.155 ; B3 = -0.332 ; B4 = 0.953 ; B5 = 0.146

DATA SOURCE: 13252 TREES FROM CENTRAL AND EASTERN CANADA

STUMP DIAMETER INSIDE BARK (CM)

POPLAR / POPULUS SPP.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.2
4	3.9	3.8	3.7	3.7	3.6	3.5	3.5	3.2
6	6.2	6.0	5.9	5.9	5.7	5.6	5.5	5.1
8	8.5	8.2	8.1	8.0	7.9	7.7	7.6	7.0
10	10.8	10.5	10.3	10.2	10.0	9.9	9.7	8.9
12	13.1	12.7	12.5	12.4	12.2	12.0	11.8	10.9
14	15.4	14.9	14.7	14.6	14.3	14.1	13.9	12.8
16	17.7	17.2	16.9	16.8	16.4	16.2	15.9	14.7
18	19.9	19.4	19.2	18.9	18.6	18.3	18.0	16.6
20	22.2	21.6	21.4	21.1	20.7	20.4	20.1	18.6
22	24.5	23.8	23.6	23.3	22.9	22.5	22.2	20.5
24	26.8	26.1	25.8	25.5	25.0	24.6	24.3	22.4
26	29.1	28.3	28.0	27.7	27.2	26.7	26.3	24.4
28	31.4	30.5	30.2	29.9	29.3	28.8	28.4	26.3
30	33.7	32.8	32.4	32.0	31.4	30.9	30.5	28.2
32	36.0	35.0	34.6	34.2	33.6	33.0	32.6	30.1
34	38.3	37.2	36.8	36.4	35.7	35.2	34.7	32.1
36	40.6	39.5	39.0	38.6	37.9	37.3	36.7	34.0
38	42.9	41.7	41.2	40.8	40.0	39.4	38.8	35.9
40	45.2	43.9	43.4	43.0	42.2	41.5	40.9	37.8
42	47.5	46.2	45.6	45.1	44.3	43.6	43.0	39.8
44	49.8	48.4	47.8	47.3	46.4	45.7	45.1	41.7
46	52.1	50.6	50.0	49.5	48.6	47.8	47.1	43.6
48	54.4	52.9	52.2	51.7	50.7	49.9	49.2	45.6
50	56.6	55.1	54.4	53.9	52.9	52.0	51.3	47.5
52	58.9	57.3	56.6	56.0	55.0	54.1	53.4	49.4
54	61.2	59.5	58.9	58.2	57.2	56.2	55.4	51.3
56	63.5	61.8	61.1	60.4	59.3	58.3	57.5	53.3
58	65.8	64.0	63.3	62.6	61.4	60.5	59.6	55.2
60	68.1	66.2	65.5	64.8	63.6	62.6	61.7	57.1
62	70.4	68.5	67.7	67.0	65.7	64.7	63.8	59.0
64	72.7	70.7	69.9	69.1	67.9	66.8	65.8	61.0
66	75.0	72.9	72.1	71.3	70.0	68.9	67.9	62.9
68	77.3	75.2	74.3	73.5	72.1	71.0	70.0	64.8
70	79.6	77.4	76.5	75.7	74.3	73.1	72.1	66.8
72	81.9	79.6	78.7	77.9	76.4	75.2	74.2	68.7
74	84.2	81.9	80.9	80.1	78.6	77.3	76.2	70.6

EQUATION: $DSI = B3+D(1-0.04365*B2)(B4+B5*LOG(1.6764/(S+0.3048)))$

WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.127 ; B3 = -0.693 ; B4 = 0.964 ; B5 = 0.111

DATA SOURCE: 1082 TREES FROM CUE., CNT., MAN.,SASK.

STUMP DIAMETER INSIDE BARK (CM)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.6	2.5	2.4	2.4	2.3	2.3	2.2	2.0
4	5.0	4.8	4.8	4.7	4.6	4.5	4.4	3.9
6	7.5	7.2	7.1	7.0	6.8	6.6	6.5	5.8
8	10.0	9.6	9.4	9.3	9.0	8.8	8.6	7.7
10	12.4	11.9	11.7	11.5	11.2	11.0	10.7	9.5
12	14.9	14.3	14.0	13.8	13.5	13.1	12.9	11.4
14	17.3	16.7	16.4	16.1	15.7	15.3	15.0	13.3
16	19.8	19.0	18.7	18.4	17.9	17.5	17.1	15.2
18	22.3	21.4	21.0	20.7	20.1	19.6	19.2	17.1
20	24.7	23.7	23.3	23.0	22.3	21.8	21.4	19.0
22	27.2	26.1	25.7	25.3	24.6	24.0	23.5	20.8
24	29.7	28.5	28.0	27.5	26.8	26.2	25.6	22.7
26	32.1	30.8	30.3	29.8	29.0	28.3	27.7	24.6
28	34.6	33.2	32.6	32.1	31.2	30.5	29.9	26.5
30	37.0	35.6	35.0	34.4	33.5	32.7	32.0	28.4
32	39.5	37.9	37.3	36.7	35.7	34.8	34.1	30.3
34	42.0	40.3	39.6	39.0	37.9	37.0	36.2	32.2
36	44.4	42.6	41.9	41.3	40.1	39.2	38.4	34.0
38	46.9	45.0	44.2	43.6	42.4	41.4	40.5	35.9
40	49.3	47.4	46.6	45.8	44.6	43.5	42.6	37.8
42	51.8	49.7	48.9	48.1	46.8	45.7	44.7	39.7
44	54.3	52.1	51.2	50.4	49.0	47.9	46.8	41.6
46	56.7	54.5	53.5	52.7	51.3	50.0	49.0	43.5
48	59.2	56.8	55.9	55.0	53.5	52.2	51.1	45.3
50	61.7	59.2	58.2	57.3	55.7	54.4	53.2	47.2
52	64.1	61.6	60.5	59.6	57.9	56.5	55.3	49.1
54	66.6	63.9	62.8	61.8	60.1	58.7	57.5	51.0
56	69.0	66.3	65.1	64.1	62.4	60.9	59.6	52.9
58	71.5	68.6	67.5	66.4	64.6	63.1	61.7	54.8
60	74.0	71.0	69.8	68.7	66.8	65.2	63.8	56.7
62	76.4	73.4	72.1	71.0	69.0	67.4	66.0	58.5
64	78.9	75.7	74.4	73.3	71.3	69.6	68.1	60.4
66	81.3	78.1	76.8	75.6	73.5	71.7	70.2	62.3
68	83.8	80.5	79.1	77.8	75.7	73.9	72.3	64.2
70	86.3	82.8	81.4	80.1	77.9	76.1	74.5	66.1
72	88.7	85.2	83.7	82.4	80.2	78.2	76.6	68.0
74	91.2	87.5	86.0	84.7	82.4	80.4	78.7	69.8

EQUATION: DSI = B3+D(1-0.04365*B2)(B4+B5*LOG(1.6764/(S+0.3048)))

WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.176 ; B3 = 0.112 ; B4 = 0.942 ; B5 = 0.175

DATA SOURCE: 298 TREES FROM GUE.. CNT.. ALTA.

STUMP DIAMETER INSIDE BARK (CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.4	2.3	2.3	2.2	2.2	2.1	2.1	1.8
4	4.9	4.7	4.6	4.6	4.4	4.3	4.2	3.7
6	7.4	7.1	7.0	6.9	6.7	6.5	6.4	5.6
8	9.9	9.5	9.3	9.2	8.9	8.7	8.5	7.5
10	12.4	11.9	11.7	11.5	11.2	10.9	10.6	9.4
12	14.9	14.3	14.0	13.8	13.4	13.1	12.8	11.3
14	17.4	16.7	16.4	16.1	15.7	15.3	14.9	13.2
16	19.9	19.1	18.7	18.4	17.9	17.5	17.1	15.1
18	22.4	21.5	21.1	20.7	20.2	19.7	19.2	17.0
20	24.9	23.9	23.4	23.1	22.4	21.8	21.4	18.9
22	27.4	26.3	25.8	25.4	24.6	24.0	23.5	20.8
24	29.9	28.6	28.1	27.7	26.9	26.2	25.7	22.6
26	32.4	31.0	30.5	30.0	29.1	28.4	27.8	24.5
28	34.9	33.4	32.8	32.3	31.4	30.6	29.9	26.4
30	37.4	35.8	35.2	34.6	33.6	32.8	32.1	28.3
32	39.9	38.2	37.5	36.9	35.9	35.0	34.2	30.2
34	42.4	40.6	39.9	39.2	38.1	37.2	36.4	32.1
36	44.9	43.0	42.2	41.6	40.4	39.4	38.5	34.0
38	47.4	45.4	44.6	43.9	42.6	41.6	40.7	35.9
40	49.9	47.8	46.9	46.2	44.9	43.8	42.8	37.8
42	52.3	50.2	49.3	48.5	47.1	46.0	44.9	39.7
44	54.8	52.6	51.6	50.8	49.4	48.1	47.1	41.6
46	57.3	55.0	54.0	53.1	51.6	50.3	49.2	43.5
48	59.8	57.4	56.3	55.4	53.9	52.5	51.4	45.4
50	62.3	59.8	58.7	57.8	56.1	54.7	53.5	47.3
52	64.8	62.1	61.0	60.1	58.4	56.9	55.7	49.1
54	67.3	64.5	63.4	62.4	60.6	59.1	57.8	51.0
56	69.8	66.9	65.7	64.7	62.9	61.3	59.9	52.9
58	72.3	69.3	68.1	67.0	65.1	63.5	62.1	54.9
60	74.8	71.7	70.5	69.3	67.3	65.7	64.2	56.7
62	77.3	74.1	72.8	71.6	69.6	67.9	66.4	58.6
64	79.8	76.5	75.2	73.9	71.8	70.1	68.5	60.5
66	82.3	78.9	77.5	76.3	74.1	72.3	70.7	62.4
68	84.8	81.3	79.9	78.6	76.3	74.4	72.8	64.3
70	87.3	83.7	82.2	80.9	78.6	76.6	75.0	66.2
72	89.8	86.1	84.6	83.2	80.8	78.8	77.1	68.1
74	92.3	88.5	86.9	85.5	83.1	81.0	79.2	70.0

EQUATION: DSI = B3+D(1-0.04365*E2)(B4+B5*LOG(1.6764/(S+0.3048)))
WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.181 ; B3 = -0.071 ; B4 = 0.946 ; B5 = 0.183

DATA SOURCE: 302 TREES FROM QUE.. CNT.

STUMP DIAMETER INSIDE BARK (CM)

HARDWOODS

DBHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.5
4	4.3	4.1	4.1	4.0	3.9	3.8	3.8	3.4
6	6.6	6.4	6.3	6.2	6.1	6.0	5.9	5.3
8	9.0	8.7	8.6	8.5	8.3	8.1	8.0	7.2
10	11.4	11.0	10.8	10.7	10.4	10.2	10.1	9.1
12	13.7	13.3	13.1	12.9	12.6	12.4	12.2	11.0
14	16.1	15.5	15.3	15.1	14.8	14.5	14.3	13.0
16	18.4	17.8	17.6	17.4	17.0	16.6	16.4	14.9
18	20.8	20.1	19.8	19.6	19.1	18.8	18.4	16.9
20	23.2	22.4	22.1	21.8	21.3	20.9	20.5	18.7
22	25.5	24.7	24.3	24.0	23.5	23.0	22.6	20.6
24	27.9	27.0	26.6	26.2	25.7	25.2	24.7	22.5
26	30.2	29.2	28.8	28.5	27.8	27.3	26.8	24.4
28	32.6	31.5	31.1	30.7	30.0	29.4	28.9	26.4
30	34.9	33.8	33.3	32.9	32.2	31.6	31.0	28.3
32	37.3	36.1	35.6	35.1	34.4	33.7	33.1	30.2
34	39.7	38.4	37.8	37.4	36.5	35.8	35.2	32.1
36	42.0	40.7	40.1	39.6	38.7	38.0	37.3	34.0
38	44.4	42.9	42.3	41.8	40.9	40.1	39.4	35.9
40	46.7	45.2	44.6	44.0	43.1	42.2	41.5	37.8
42	49.1	47.5	46.9	46.3	45.2	44.4	43.6	39.7
44	51.5	49.8	49.1	48.5	47.4	46.5	45.7	41.7
46	53.8	52.1	51.4	50.7	49.6	48.7	47.8	43.6
48	56.2	54.4	53.6	52.9	51.8	50.8	49.9	45.5
50	58.5	56.6	55.9	55.2	53.9	52.9	52.0	47.4
52	60.9	58.9	58.1	57.4	56.1	55.1	54.1	49.3
54	63.3	61.2	60.4	59.6	58.3	57.2	56.2	51.2
56	65.6	63.5	62.6	61.8	60.5	59.3	58.3	53.1
58	68.0	65.8	64.9	64.1	62.6	61.5	60.4	55.1
60	70.3	68.1	67.1	66.3	64.8	63.6	62.5	57.0
62	72.7	70.3	69.4	68.5	67.0	65.7	64.6	58.9
64	75.1	72.6	71.6	70.7	69.2	67.9	66.7	60.8
66	77.4	74.9	73.9	72.9	71.3	70.0	68.8	62.7
68	79.8	77.2	76.1	75.2	73.5	72.1	70.9	64.6
70	82.1	79.5	78.4	77.4	75.7	74.3	73.0	66.5
72	84.5	81.8	80.6	79.6	77.9	76.4	75.1	68.5
74	86.9	84.0	82.9	81.8	80.1	78.5	77.2	70.4

EQUATION: DSI = B3+D(1-0.04365*E2)(B4+B5*LOG(1.6764/(S+0.3048)))

WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHOB ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.145 ; B3 = -0.439 ; B4 = 0.957 ; B5 = 0.135

DATA SOURCE: 1682 TREES FROM QUE., ONT., MAN., SASK., ALTA.

APPENDIX VII Diameter Breast Height Outside Bark Using Stump Diameter Inside Bark

SPECIES	PAGE
Eastern white pine (Pinus strobus L.)	126
Red pine (Pinus resinosa Ait.)	127
Jack pine (Pinus banksiana Lamb.)	128
Lodgepole pine (Pinus contorta Dougl. var. latifolia Engelm.)	129
Black spruce (Picea mariana (Mill.) B.S.P.)	130
Red spruce (Picea rubens Sarg.)	131
White spruce (Picea glauca (Moench) Voss.)	132
Balsam fir (Abies balsamea (L.) (Mill.))	133
Softwoods	134
Poplar spp. (Populus)	135
White birch (Betula papyrifera Marsh.)	136
Yellow birch (Betula alleghaniensis Britt.)	137
Hardwoods	138

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.4	4.7	4.8	4.9	5.0	5.2	5.3	6.0
10	8.2	8.7	8.9	9.1	9.5	9.8	10.0	11.3
15	11.9	12.7	13.1	13.4	13.9	14.3	14.7	16.7
20	15.7	16.8	17.2	17.6	18.3	18.9	19.4	22.1
22	17.2	18.4	18.9	19.3	20.1	20.7	21.3	24.2
24	18.7	20.0	20.6	21.0	21.9	22.6	23.2	26.4
26	20.2	21.6	22.2	22.7	23.6	24.4	25.1	28.5
28	21.7	23.3	23.9	24.4	25.4	26.2	26.9	30.6
30	23.2	24.9	25.5	26.1	27.2	28.1	28.8	32.8
32	24.8	26.5	27.2	27.8	29.0	29.9	30.7	34.9
34	26.3	28.1	28.9	29.5	30.7	31.7	32.6	37.1
36	27.8	29.7	30.5	31.3	32.5	33.6	34.5	39.2
38	29.3	31.3	32.2	33.0	34.3	35.4	36.3	41.4
40	30.8	33.0	33.9	34.7	36.0	37.2	38.2	43.5
42	32.3	34.6	35.5	36.4	37.8	39.0	40.1	45.7
44	33.8	36.2	37.2	38.1	39.6	40.9	42.0	47.8
46	35.3	37.8	38.8	39.8	41.4	42.7	43.9	49.9
48	36.8	39.4	40.5	41.5	43.1	44.5	45.7	52.1
50	38.3	41.0	42.2	43.2	44.9	46.4	47.6	54.2
52	39.8	42.7	43.8	44.9	46.7	48.2	49.5	56.4
54	41.3	44.3	45.5	46.6	48.4	50.0	51.4	58.5
56	42.9	45.9	47.1	48.3	50.2	51.8	53.3	60.7
58	44.4	47.5	48.8	50.0	52.0	53.7	55.1	62.8
60	45.9	49.1	50.5	51.7	53.7	55.5	57.0	65.0
62	47.4	50.7	52.1	53.4	55.5	57.3	58.9	67.1
64	48.9	52.4	53.8	55.1	57.3	59.2	60.8	69.3
66	50.4	54.0	55.5	56.8	59.1	61.0	62.7	71.4
68	51.9	55.6	57.1	58.5	60.8	62.8	64.6	73.5
70	53.4	57.2	58.8	60.2	62.6	64.7	66.4	75.7
72	54.9	58.8	60.4	61.9	64.4	66.5	68.3	77.8
74	56.4	60.5	62.1	63.6	66.1	68.3	70.2	80.0
76	57.9	62.1	63.8	65.3	67.9	70.1	72.1	82.1
78	59.4	63.7	65.4	67.0	69.7	72.0	74.0	84.3
80	61.0	65.3	67.1	68.7	71.5	73.8	75.8	86.4
82	62.5	66.9	68.7	70.4	73.2	75.6	77.7	88.6
84	64.0	68.5	70.4	72.1	75.0	77.5	79.6	90.7
86	65.5	70.2	72.1	73.8	76.8	79.3	81.5	92.8
88	67.0	71.8	73.7	75.5	78.5	81.1	83.4	95.0
90	68.5	73.4	75.4	77.2	80.3	82.9	85.2	97.1

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.184 ; B6 = 0.617 ; B7 = 1.072 ; B8 = 0.190

DATA SOURCE: 1198 TREES FROM N.B., QUE., ONT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
8	4.3	4.5	4.6	4.7	4.8	4.9	5.0	5.5
10	8.4	8.9	9.0	9.2	9.5	9.7	9.9	11.0
15	12.6	13.2	13.5	13.7	14.1	14.5	14.8	16.4
20	16.7	17.6	18.0	18.3	18.8	19.3	19.7	21.8
22	18.4	19.3	19.7	20.1	20.7	21.2	21.6	24.0
24	20.1	21.1	21.5	21.9	22.6	23.1	23.6	26.1
26	21.7	22.8	23.3	23.7	24.4	25.0	25.6	28.3
28	23.4	24.6	25.1	25.5	26.3	26.9	27.5	30.4
30	25.0	26.3	26.9	27.3	28.2	28.9	29.5	32.6
32	26.7	28.1	28.6	29.2	30.0	30.8	31.4	34.8
34	28.4	29.8	30.4	31.0	31.9	32.7	33.4	36.9
36	30.0	31.6	32.2	32.8	33.8	34.6	35.3	39.1
38	31.7	33.3	34.0	34.6	35.6	36.5	37.3	41.3
40	33.3	35.1	35.8	36.4	37.5	38.4	39.2	43.4
42	35.0	36.8	37.6	38.2	39.4	40.3	41.2	45.6
44	36.7	38.6	39.3	40.0	41.2	42.1	43.2	47.8
46	38.3	40.3	41.1	41.8	43.1	44.2	45.1	49.9
48	40.0	42.0	42.9	43.7	45.0	46.1	47.1	52.1
50	41.6	43.8	44.7	45.5	46.8	48.0	49.0	54.3
52	43.3	45.5	46.5	47.3	48.7	49.9	51.0	56.4
54	45.0	47.3	48.2	49.1	50.6	51.8	52.9	58.6
56	46.6	49.0	50.0	50.9	52.5	53.8	54.9	60.8
58	48.3	50.8	51.8	52.7	54.3	55.7	56.8	62.9
60	49.9	52.5	53.6	54.5	56.2	57.6	58.8	65.1
62	51.6	54.3	55.4	56.4	58.1	59.5	60.7	67.3
64	53.3	56.0	57.2	58.2	59.9	61.4	62.7	69.4
66	54.9	57.8	58.9	60.0	61.8	63.3	64.7	71.6
68	56.6	59.5	60.7	61.8	63.7	65.2	66.6	73.7
70	58.2	61.3	62.5	63.6	65.5	67.2	68.6	75.9
72	59.9	63.0	64.3	65.4	67.4	69.1	70.5	78.1
74	61.6	64.8	66.1	67.2	69.3	71.0	72.5	80.2
76	63.2	66.5	67.8	69.0	71.1	72.9	74.4	82.4
78	64.9	68.2	69.6	70.9	73.0	74.8	76.4	84.6
80	66.5	70.0	71.4	72.7	74.9	76.7	78.3	86.7
82	68.2	71.7	73.2	74.5	76.7	78.6	80.3	88.9
84	69.9	73.5	75.0	76.3	78.6	80.6	82.3	91.1
86	71.5	75.2	76.8	78.1	80.5	82.5	84.2	93.2
88	73.2	77.0	78.5	79.9	82.3	84.4	86.2	95.4
90	74.8	78.7	80.3	81.7	84.2	86.3	88.1	97.6

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.0784)))/(1-0.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.151 ; B6 = 0.135 ; B7 = 1.082 ; B8 = 0.151

DATA SOURCE: 1480 TREES FROM N.B.,QUE., ONT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

JACK PINE / PINUS BANKSIANA LAMB.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.9	5.1	5.1	5.2	5.3	5.4	5.5	5.9
10	9.1	9.4	9.5	9.7	9.9	10.0	10.2	11.0
15	13.2	13.7	13.9	14.1	14.4	14.7	14.9	16.2
20	17.4	18.1	18.3	18.6	19.0	19.4	19.7	21.3
22	19.1	19.8	20.1	20.4	20.8	21.2	21.6	23.4
24	20.7	21.5	21.8	22.1	22.7	23.1	23.5	25.4
26	22.4	23.3	23.6	23.9	24.5	25.0	25.4	27.5
28	24.1	25.0	25.4	25.7	26.3	26.8	27.3	29.5
30	25.7	26.7	27.1	27.5	28.1	28.7	29.1	31.6
32	27.4	28.5	28.9	29.3	30.0	30.5	31.0	33.6
34	29.0	30.2	30.7	31.1	31.8	32.4	32.9	35.7
36	30.7	31.9	32.4	32.9	33.6	34.3	34.8	37.8
38	32.4	33.7	34.2	34.6	35.4	36.1	36.7	39.8
40	34.0	35.4	35.9	36.4	37.3	38.0	38.6	41.9
42	35.7	37.1	37.7	38.2	39.1	39.9	40.5	43.9
44	37.4	38.8	39.5	40.0	40.9	41.7	42.4	46.0
46	39.0	40.6	41.2	41.8	42.8	43.6	44.3	48.0
48	40.7	42.3	43.0	43.6	44.6	45.5	46.2	50.1
50	42.4	44.0	44.7	45.3	46.4	47.3	48.1	52.2
52	44.0	45.8	46.5	47.1	48.2	49.2	50.0	54.2
54	45.7	47.5	48.3	48.9	50.1	51.0	51.9	56.3
56	47.4	49.2	50.0	50.7	51.9	52.9	53.8	58.3
58	49.0	51.0	51.8	52.5	53.7	54.8	55.7	60.4
60	50.7	52.7	53.5	54.3	55.6	56.6	57.6	62.4
62	52.4	54.4	55.3	56.1	57.4	58.5	59.5	64.5
64	54.0	56.2	57.1	57.8	59.2	60.4	61.4	66.6
66	55.7	57.9	58.8	59.6	61.0	62.2	63.2	68.6
68	57.4	59.6	60.6	61.4	62.9	64.1	65.1	70.7
70	59.0	61.4	62.3	63.2	64.7	65.9	67.0	72.7
72	60.7	63.1	64.1	65.0	66.5	67.8	68.9	74.8
74	62.4	64.8	65.9	66.8	68.3	69.7	70.8	76.8
76	64.0	66.6	67.6	68.6	70.2	71.5	72.7	78.9
78	65.7	68.3	69.4	70.3	72.0	73.4	74.6	81.0
80	67.4	70.0	71.1	72.1	73.8	75.3	76.5	83.0
82	69.0	71.8	72.9	73.9	75.7	77.1	78.4	85.1
84	70.7	73.5	74.7	75.7	77.5	79.0	80.3	87.1
86	72.4	75.2	76.4	77.5	79.3	80.9	82.2	89.2
88	74.0	77.0	78.2	79.3	81.1	82.7	84.1	91.2
90	75.7	78.7	79.9	81.0	83.0	84.6	86.0	93.3

EQUATION: $D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)$

WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.151 ; B6 = 0.721 ; B7 = 1.027 ; B8 = 0.117

DATA SOURCE: 2944 TREES FROM OUE.. ONT.. MAN.. SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.7	4.9	4.9	5.0	5.1	5.2	5.2	5.6
10	8.9	9.2	9.4	9.5	9.7	9.9	10.0	10.8
15	13.1	13.6	13.8	14.0	14.3	14.5	14.8	15.9
20	17.3	18.0	18.2	18.5	18.9	19.2	19.5	21.1
22	19.0	19.7	20.0	20.3	20.7	21.1	21.4	23.1
24	20.7	21.5	21.8	22.0	22.5	23.0	23.3	25.2
26	22.4	23.2	23.5	23.8	24.4	24.8	25.2	27.2
28	24.1	24.9	25.3	25.6	26.2	26.7	27.1	29.3
30	25.7	26.7	27.1	27.4	28.0	28.6	29.0	31.3
32	27.4	28.4	28.9	29.2	29.9	30.4	30.9	33.4
34	29.1	30.2	30.6	31.0	31.7	32.3	32.8	35.5
36	30.8	31.9	32.4	32.8	33.6	34.2	34.7	37.5
38	32.5	33.7	34.2	34.6	35.4	36.1	35.6	39.6
40	34.1	35.4	36.0	36.4	37.2	37.9	38.5	41.6
42	35.8	37.2	37.7	38.2	39.1	39.8	40.4	43.7
44	37.5	38.9	39.5	40.0	40.9	41.7	42.3	45.7
46	39.2	40.7	41.3	41.8	42.7	43.5	44.2	47.8
48	40.9	42.4	43.0	43.6	44.6	45.4	46.1	49.9
50	42.6	44.2	44.8	45.4	46.4	47.3	48.0	51.9
52	44.2	45.9	46.6	47.2	48.3	49.2	49.9	54.0
54	45.9	47.7	48.4	49.0	50.1	51.0	51.8	56.0
56	47.6	49.4	50.1	50.8	51.9	52.9	53.7	58.1
58	49.3	51.1	51.9	52.6	53.8	54.8	55.6	60.1
60	51.0	52.9	53.7	54.4	55.6	56.6	57.5	62.2
62	52.7	54.6	55.5	56.2	57.4	58.5	59.4	64.3
64	54.3	56.4	57.2	58.0	59.3	60.4	61.3	66.3
66	56.0	58.1	59.0	59.8	61.1	62.3	63.2	68.4
68	57.7	59.9	60.8	61.6	63.0	64.1	65.1	70.4
70	59.4	61.6	62.5	63.4	64.8	66.0	67.0	72.5
72	61.1	63.4	64.3	65.2	66.6	67.9	68.9	74.5
74	62.8	65.1	66.1	67.0	68.5	69.7	70.8	76.6
76	64.4	66.9	67.9	68.8	70.3	71.6	72.7	78.7
78	66.1	68.6	69.6	70.6	72.1	73.5	74.6	80.7
80	67.8	70.4	71.4	72.3	74.0	75.4	76.5	82.8
82	69.5	72.1	73.2	74.1	75.8	77.2	78.5	84.8
84	71.2	73.9	75.0	75.9	77.7	79.1	80.4	86.9
86	72.9	75.6	76.7	77.7	79.5	81.0	82.3	88.9
88	74.5	77.3	78.5	79.5	81.3	82.8	84.2	91.0
90	76.2	79.1	80.3	81.3	83.2	84.7	86.1	93.0

EQUATION: $D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)$

WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.118 ; B6 = 0.490 ; B7 = 1.028 ; B8 = 0.112

DATA SOURCE: 2110 TREES FROM ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
8	4.7	4.9	5.0	5.1	5.2	5.4	5.5	6.0
10	8.5	8.9	9.1	9.2	9.5	9.8	10.0	11.1
12	12.2	12.9	13.2	13.4	13.8	14.2	14.5	16.1
20	16.0	16.9	17.2	17.6	18.1	18.6	19.0	21.2
22	17.5	18.4	18.9	19.2	19.8	20.4	20.8	23.2
24	19.0	20.0	20.5	20.9	21.6	22.1	22.6	25.3
26	20.5	21.6	22.1	22.5	23.3	23.9	24.5	27.3
28	22.0	23.2	23.7	24.2	25.0	25.7	26.3	29.3
30	23.5	24.8	25.4	25.9	26.7	27.4	28.1	31.3
32	25.0	26.4	27.0	27.5	28.4	29.2	29.9	33.4
34	26.5	28.0	28.6	29.2	30.2	31.0	31.7	35.4
36	28.0	29.6	30.2	30.8	31.9	32.7	33.5	37.4
38	29.5	31.2	31.9	32.5	33.6	34.5	35.3	39.5
40	31.0	32.8	33.5	34.2	35.3	36.3	37.1	41.5
42	32.5	34.4	35.1	35.8	37.0	38.0	38.9	43.5
44	34.0	35.9	36.8	37.5	38.7	39.8	40.7	45.5
46	35.5	37.5	38.4	39.1	40.5	41.6	42.5	47.6
48	37.0	39.1	40.0	40.8	42.2	43.3	44.3	49.6
50	38.5	40.7	41.6	42.5	43.9	45.1	46.2	51.6
52	40.0	42.3	43.3	44.1	45.6	46.9	48.0	53.6
54	41.5	43.9	44.9	45.8	47.3	48.6	49.8	55.7
56	43.0	45.5	46.5	47.5	49.1	50.4	51.6	57.7
58	44.5	47.1	48.2	49.1	50.8	52.2	53.4	59.7
60	46.0	48.7	49.8	50.8	52.5	53.9	55.2	61.7
62	47.5	50.3	51.4	52.4	54.2	55.7	57.0	63.8
64	49.0	51.9	53.0	54.1	55.9	57.5	58.8	65.8
66	50.5	53.5	54.7	55.8	57.6	59.2	60.6	67.8
68	52.0	55.0	56.3	57.4	59.4	61.0	62.4	69.9
70	53.5	56.6	57.9	59.1	61.1	62.8	64.2	71.9
72	55.0	58.2	59.6	60.7	62.8	64.5	66.1	73.9
74	56.5	59.8	61.2	62.4	64.5	66.3	67.9	75.9
76	58.0	61.4	62.8	64.1	66.2	68.1	69.7	78.0
78	59.5	63.0	64.4	65.7	68.0	69.8	71.5	80.0
80	61.0	64.6	66.1	67.4	69.7	71.6	73.3	82.0
82	62.5	66.2	67.7	69.0	71.4	73.4	75.1	84.0
84	64.0	67.8	69.3	70.7	73.1	75.1	76.9	86.1
86	65.5	69.4	70.9	72.4	74.8	76.9	78.7	88.1
88	67.0	71.0	72.6	74.0	76.5	78.7	80.5	90.1
90	68.5	72.5	74.2	75.7	78.3	80.4	82.3	92.1

EQUATION: $D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-B2*B2)$

WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.164 ; B6 = 0.937 ; B7 = 1.013 ; B8 = 0.157

DATA SOURCE: 1766 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.1	4.4	4.5	4.6	4.7	4.9	5.0	5.6
10	7.8	8.3	8.5	8.7	9.1	9.3	9.6	10.8
15	11.5	12.3	12.6	12.9	13.4	13.8	14.1	16.0
20	15.2	16.3	16.7	17.0	17.7	18.2	18.7	21.2
22	16.7	17.8	18.3	18.7	19.4	20.0	20.5	23.2
24	18.2	19.4	19.9	20.4	21.1	21.8	22.4	25.3
26	19.7	21.0	21.5	22.0	22.9	23.6	24.2	27.4
28	21.2	22.6	23.2	23.7	24.6	25.4	26.0	29.5
30	22.6	24.2	24.8	25.3	26.3	27.1	27.8	31.5
32	24.1	25.7	26.4	27.0	28.0	28.9	29.7	33.6
34	25.6	27.3	28.0	28.7	29.8	30.7	31.5	35.7
36	27.1	28.9	29.7	30.3	31.5	32.5	33.3	37.8
38	28.6	30.5	31.3	32.0	33.2	34.3	35.2	39.8
40	30.1	32.1	32.9	33.7	34.9	36.0	37.0	41.9
42	31.5	33.7	34.5	35.3	36.7	37.8	38.8	44.0
44	33.0	35.2	36.2	37.0	38.4	39.6	40.6	46.1
46	34.5	36.8	37.8	38.6	40.1	41.4	42.5	48.1
48	36.0	38.4	39.4	40.3	41.8	43.2	44.3	50.2
50	37.5	40.0	41.0	42.0	43.6	44.9	46.1	52.3
52	38.9	41.6	42.7	43.6	45.3	46.7	47.9	54.3
54	40.4	43.2	44.3	45.3	47.0	48.5	49.8	56.4
56	41.9	44.7	45.9	46.9	48.8	50.3	51.6	58.5
58	43.4	46.3	47.5	48.6	50.5	52.1	53.4	60.6
60	44.9	47.9	49.2	50.3	52.2	53.8	55.3	62.6
62	46.4	49.5	50.8	51.9	53.9	55.6	57.1	64.7
64	47.8	51.1	52.4	53.6	55.7	57.4	58.9	66.8
66	49.3	52.7	54.0	55.3	57.4	59.2	60.7	68.9
68	50.8	54.2	55.6	56.9	59.1	61.0	62.6	70.9
70	52.3	55.8	57.3	58.6	60.8	62.7	64.4	73.0
72	53.8	57.4	58.9	60.2	62.6	64.5	66.2	75.1
74	55.2	59.0	60.5	61.9	64.3	66.3	68.1	77.2
76	56.7	60.6	62.1	63.6	66.0	68.1	69.9	79.2
78	58.2	62.1	63.8	65.2	67.7	69.9	71.7	81.3
80	59.7	63.7	65.4	66.9	69.5	71.6	73.5	83.4
82	61.2	65.3	67.0	68.5	71.2	73.4	75.4	85.5
84	62.6	66.9	68.6	70.2	72.9	75.2	77.2	87.5
86	64.1	68.5	70.3	71.9	74.6	77.0	79.0	89.6
88	65.6	70.1	71.9	73.5	76.4	78.8	80.8	91.7
90	67.1	71.6	73.5	75.2	78.1	80.5	82.7	93.8

EQUATION: $D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)$

WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.169 ; B6 = 0.424 ; B7 = 1.037 ; B8 = 0.177

DATA SOURCE: 146 TREES FROM N.B.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DSIB CLASS (CM)	STUMP HEIGHT (M) 0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	5.0	5.2	5.3	5.4	5.5	5.7	5.8	6.4
10	8.5	9.0	9.2	9.4	9.7	10.0	10.2	11.4
15	12.1	12.8	13.1	13.4	13.9	14.2	14.6	16.3
20	15.7	16.6	17.0	17.4	18.0	18.5	19.0	21.3
22	17.1	18.2	18.6	19.0	19.7	20.2	20.7	23.3
24	18.5	19.7	20.2	20.6	21.3	22.0	22.5	25.3
26	20.0	21.2	21.7	22.2	23.0	23.7	24.3	27.3
28	21.4	22.7	23.3	23.8	24.7	25.4	26.0	29.3
30	22.8	24.3	24.9	25.4	26.3	27.1	27.8	31.3
32	24.2	25.8	26.4	27.0	28.0	28.8	29.5	33.3
34	25.7	27.3	28.0	28.6	29.6	30.5	31.3	35.3
36	27.1	28.8	29.6	30.2	31.3	32.2	33.1	37.3
38	28.5	30.4	31.1	31.8	33.0	34.0	34.8	39.3
40	30.0	31.9	32.7	33.4	34.6	35.7	36.6	41.3
42	31.4	33.4	34.2	35.0	36.3	37.4	38.3	43.3
44	32.8	34.9	35.8	36.6	38.0	39.1	40.1	45.3
46	34.2	36.5	37.4	38.2	39.6	40.8	41.9	47.3
48	35.7	38.0	38.9	39.8	41.3	42.5	43.6	49.3
50	37.1	39.5	40.5	41.4	42.9	44.2	45.4	51.2
52	38.5	41.0	42.1	43.0	44.6	46.0	47.1	53.2
54	40.0	42.6	43.6	44.6	46.3	47.7	48.9	55.2
56	41.4	44.1	45.2	46.2	47.9	49.4	50.6	57.2
58	42.8	45.6	46.8	47.8	49.6	51.1	52.4	59.2
60	44.2	47.1	48.3	49.4	51.2	52.8	54.2	61.2
62	45.7	48.7	49.9	51.0	52.9	54.5	55.9	63.2
64	47.1	50.2	51.5	52.6	54.6	56.2	57.7	65.2
66	48.5	51.7	53.0	54.2	56.2	58.0	59.4	67.2
68	50.0	53.2	54.6	55.8	57.9	59.7	61.2	69.2
70	51.4	54.8	56.2	57.4	59.6	61.4	63.0	71.2
72	52.8	56.3	57.7	59.0	61.2	63.1	64.7	73.2
74	54.2	57.8	59.3	60.6	62.9	64.8	66.5	75.2
76	55.7	59.3	60.9	62.2	64.5	66.5	68.2	77.2
78	57.1	60.9	62.4	63.8	66.2	68.2	70.0	79.2
80	58.5	62.4	64.0	65.4	67.9	70.0	71.8	81.2
82	60.0	63.9	65.6	67.0	69.5	71.7	73.5	83.2
84	61.4	65.5	67.1	68.6	71.2	73.4	75.3	85.2
86	62.8	67.0	68.7	70.2	72.9	75.1	77.0	87.1
88	64.2	68.5	70.2	71.8	74.5	76.8	78.8	89.1
90	65.7	70.0	71.8	73.4	76.2	78.5	80.6	91.1

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.3764)))/(1-0.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.176 ; B6 = 1.372 ; B7 = 0.997 ; B8 = 0.169

DATA SOURCE: 1292 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	5.0	5.2	5.2	5.3	5.4	5.5	5.6	6.0
10	9.0	9.4	9.5	9.6	9.9	10.0	10.2	11.1
15	13.0	13.6	13.8	14.0	14.3	14.6	14.8	16.1
20	17.1	17.8	18.1	18.3	18.8	19.1	19.5	21.2
22	18.7	19.5	19.8	20.0	20.5	20.9	21.3	23.2
24	20.3	21.1	21.5	21.8	22.3	22.8	23.2	25.2
26	21.9	22.8	23.2	23.5	24.1	24.6	25.0	27.2
28	23.5	24.5	24.9	25.3	25.9	26.4	26.9	29.2
30	25.1	26.2	26.6	27.0	27.7	28.2	28.7	31.2
32	26.7	27.9	28.3	28.7	29.4	30.0	30.6	33.3
34	28.3	29.5	30.0	30.5	31.2	31.8	32.4	35.3
36	30.0	31.2	31.7	32.2	33.0	33.7	34.3	37.3
38	31.6	32.9	33.4	33.9	34.8	35.5	36.1	39.3
40	33.2	34.6	35.1	35.7	36.5	37.3	38.0	41.3
42	34.8	36.3	36.9	37.4	38.3	39.1	39.8	43.4
44	36.4	37.9	38.6	39.1	40.1	40.9	41.6	45.4
46	38.0	39.6	40.3	40.9	41.9	42.7	43.5	47.4
48	39.6	41.3	42.0	42.6	43.7	44.6	45.3	49.4
50	41.2	43.0	43.7	44.3	45.4	46.4	47.2	51.4
52	42.8	44.7	45.4	46.1	47.2	48.2	49.0	53.5
54	44.5	46.3	47.1	47.8	49.0	50.0	50.9	55.5
56	46.1	48.0	48.8	49.5	50.8	51.8	52.7	57.5
58	47.7	49.7	50.5	51.3	52.6	53.6	54.6	59.5
60	49.3	51.4	52.2	53.0	54.3	55.5	56.4	61.5
62	50.9	53.1	53.9	54.7	56.1	57.3	58.3	63.5
64	52.5	54.7	55.7	56.5	57.9	59.1	60.1	65.6
66	54.1	56.4	57.4	58.2	59.7	60.9	62.0	67.6
68	55.7	58.1	59.1	59.9	61.5	62.7	63.8	69.6
70	57.3	59.8	60.8	61.7	63.2	64.5	65.7	71.6
72	59.0	61.5	62.5	63.4	65.0	66.4	67.5	73.6
74	60.6	63.1	64.2	65.1	66.8	68.2	69.4	75.7
76	62.2	64.8	65.9	66.9	68.6	70.0	71.2	77.7
78	63.8	66.5	67.6	68.6	70.3	71.8	73.1	79.7
80	65.4	68.2	69.3	70.4	72.1	73.6	74.9	81.7
82	67.0	69.9	71.0	72.1	73.9	75.4	76.8	83.7
84	68.6	71.5	72.7	73.8	75.7	77.3	78.6	85.8
86	70.2	73.2	74.5	75.6	77.5	79.1	80.5	87.8
88	71.8	74.9	76.2	77.3	79.2	80.9	82.3	89.8
90	73.4	76.6	77.9	79.0	81.0	82.7	84.2	91.8

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.152 ; B6 = 0.960 ; B7 = 1.008 ; B8 = 0.122

DATA SOURCE: 2316 TREES FROM NFLD., N.B., QUE., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

SOFTWOODS

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.7	4.9	5.0	5.1	5.2	5.3	5.4	5.9
10	8.7	9.1	9.3	9.4	9.7	9.9	10.1	11.1
15	12.7	13.3	13.5	13.7	14.1	14.5	14.7	16.2
20	16.6	17.5	17.8	18.1	18.6	19.0	19.4	21.4
22	18.2	19.1	19.5	19.8	20.4	20.9	21.3	23.5
24	19.8	20.8	21.2	21.6	22.2	22.7	23.2	25.5
26	21.4	22.5	22.9	23.3	24.0	24.5	25.0	27.6
28	23.0	24.2	24.6	25.0	25.8	26.4	26.9	29.7
30	24.6	25.8	26.3	26.8	27.5	28.2	28.8	31.7
32	26.2	27.5	28.0	28.5	29.3	30.0	30.6	33.8
34	27.8	29.2	29.7	30.2	31.1	31.9	32.5	35.9
36	29.4	30.8	31.4	32.0	32.9	33.7	34.4	37.9
38	31.0	32.5	33.2	33.7	34.7	35.5	36.3	40.0
40	32.6	34.2	34.9	35.5	36.5	37.4	38.1	42.1
42	34.2	35.9	36.6	37.2	38.3	39.2	40.0	44.1
44	35.8	37.5	38.3	38.9	40.1	41.0	41.9	46.2
46	37.4	39.2	40.0	40.7	41.9	42.9	43.7	48.3
48	38.9	40.9	41.7	42.4	43.6	44.7	45.6	50.3
50	40.5	42.6	43.4	44.1	45.4	46.5	47.5	52.4
52	42.1	44.2	45.1	45.9	47.2	48.4	49.3	54.5
54	43.7	45.9	46.8	47.6	49.0	50.2	51.2	56.5
56	45.3	47.6	48.5	49.4	50.8	52.0	53.1	58.6
58	46.9	49.3	50.2	51.1	52.6	53.9	55.0	60.7
60	48.5	50.9	51.9	52.8	54.4	55.7	56.8	62.7
62	50.1	52.6	53.6	54.6	56.2	57.5	58.7	64.8
64	51.7	54.3	55.3	56.3	58.0	59.4	60.5	66.9
66	53.3	56.0	57.1	58.0	59.7	61.2	62.4	69.0
68	54.9	57.6	58.8	59.8	61.5	63.0	64.3	71.0
70	56.5	59.3	60.5	61.5	63.3	64.9	66.2	73.1
72	58.1	61.0	62.2	63.2	65.1	66.7	68.0	75.2
74	59.6	62.6	63.9	65.0	66.9	68.5	69.9	77.2
76	61.2	64.3	65.6	66.7	68.7	70.3	71.8	79.3
78	62.8	66.0	67.3	68.5	70.5	72.2	73.7	81.4
80	64.4	67.7	69.0	70.2	72.3	74.0	75.5	83.4
82	66.0	69.3	70.7	71.9	74.1	75.8	77.4	85.5
84	67.6	71.0	72.4	73.7	75.8	77.7	79.3	87.6
86	69.2	72.7	74.1	75.4	77.6	79.5	81.1	89.6
88	70.8	74.4	75.8	77.1	79.4	81.3	83.0	91.7
90	72.4	76.0	77.5	78.9	81.2	83.2	84.9	93.8

EQUATION: $D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)$

WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.155 ; B6 = 0.716 ; B7 = 1.033 ; B8 = 0.142

DATA SOURCE: 13252 TREES FROM CENTRAL AND EASTERN CANADA

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

POPLAR / POPULUS SPP.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	5.1	5.2	5.3	5.4	5.5	5.5	5.6	6.0
10	9.3	9.6	9.7	9.9	10.1	10.2	10.4	11.2
15	13.5	14.0	14.2	14.4	14.7	14.9	15.2	16.3
20	17.7	18.4	18.6	18.9	19.3	19.6	19.9	21.5
22	19.4	20.1	20.4	20.7	21.1	21.5	21.8	23.6
24	21.1	21.9	22.2	22.5	23.0	23.4	23.7	25.6
26	22.8	23.6	24.0	24.3	24.8	25.3	25.7	27.7
28	24.4	25.4	25.7	26.1	26.6	27.1	27.6	29.8
30	26.1	27.1	27.5	27.9	28.5	29.0	29.5	31.8
32	27.8	28.9	29.3	29.7	30.3	30.9	31.4	33.9
34	29.5	30.6	31.1	31.5	32.2	32.8	33.3	36.0
36	31.2	32.4	32.8	33.3	34.0	34.6	35.2	38.0
38	32.9	34.1	34.6	35.1	35.9	36.5	37.1	40.1
40	34.6	35.9	36.4	36.9	37.7	38.4	39.0	42.2
42	36.2	37.6	38.2	38.7	39.5	40.3	40.9	44.2
44	37.9	39.4	39.9	40.5	41.4	42.1	42.8	46.3
46	39.6	41.1	41.7	42.3	43.2	44.0	44.7	48.4
48	41.3	42.9	43.5	44.1	45.1	45.9	46.6	50.4
50	43.0	44.6	45.3	45.9	46.9	47.8	48.5	52.5
52	44.7	46.4	47.0	47.7	48.7	49.7	50.4	54.6
54	46.3	48.1	48.8	49.5	50.6	51.5	52.4	56.6
56	48.0	49.8	50.6	51.3	52.4	53.4	54.3	58.7
58	49.7	51.6	52.4	53.1	54.3	55.3	56.2	60.8
60	51.4	53.3	54.2	54.9	56.1	57.2	58.1	62.8
62	53.1	55.1	55.9	56.7	58.0	59.0	60.0	64.9
64	54.8	56.8	57.7	58.5	59.8	60.9	61.9	67.0
66	56.5	58.6	59.5	60.3	61.6	62.8	63.8	69.0
68	58.1	60.3	61.3	62.1	63.5	64.7	65.7	71.1
70	59.8	62.1	63.0	63.9	65.3	66.5	67.6	73.2
72	61.5	63.8	64.8	65.7	67.2	68.4	69.5	75.2
74	63.2	65.6	66.6	67.5	69.0	70.3	71.4	77.3
76	64.9	67.3	68.4	69.3	70.8	72.2	73.3	79.3
78	66.6	69.1	70.1	71.1	72.7	74.1	75.2	81.4
80	68.2	70.8	71.9	72.9	74.5	75.9	77.1	83.5
82	69.9	72.6	73.7	74.7	76.4	77.8	79.1	85.5
84	71.6	74.3	75.5	76.5	78.2	79.7	81.0	87.6
86	73.3	76.1	77.2	78.3	80.1	81.6	82.9	89.7
88	75.0	77.8	79.0	80.1	81.9	83.4	84.8	91.7
90	76.7	79.6	80.8	81.9	83.7	85.3	86.7	93.8

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-C.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.127 ; B6 = 0.853 ; B7 = 1.032 ; B8 = 0.114

DATA SOURCE: 1082 TREES FROM QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.0	4.3	4.4	4.5	4.6	4.7	4.9	5.5
10	7.8	8.3	8.5	8.7	9.0	9.3	9.5	10.7
15	11.6	12.3	12.6	12.9	13.4	13.8	14.1	15.9
20	15.3	16.3	16.7	17.1	17.7	18.3	18.7	21.2
22	16.8	17.9	18.4	18.8	19.5	20.1	20.6	23.2
24	18.3	19.5	20.0	20.5	21.2	21.9	22.4	25.3
26	19.9	21.1	21.7	22.2	23.0	23.7	24.3	27.4
28	21.4	22.8	23.3	23.8	24.7	25.5	26.1	29.5
30	22.9	24.4	25.0	25.5	26.5	27.3	28.0	31.6
32	24.4	26.0	26.6	27.2	28.2	29.1	29.8	33.7
34	25.9	27.6	28.3	28.9	30.0	30.9	31.7	35.8
36	27.4	29.2	29.9	30.6	31.7	32.7	33.5	37.9
38	28.9	30.8	31.6	32.3	33.5	34.5	35.4	40.0
40	30.4	32.4	33.2	33.9	35.2	36.3	37.2	42.1
42	31.9	34.0	34.9	35.6	37.0	38.1	39.1	44.2
44	33.4	35.6	36.5	37.3	38.7	39.9	40.9	46.2
46	34.9	37.2	38.2	39.0	40.5	41.7	42.8	48.3
48	36.4	38.8	39.8	40.7	42.2	43.5	44.6	50.4
50	38.0	40.4	41.5	42.4	44.0	45.3	46.5	52.5
52	39.5	42.0	43.1	44.1	45.7	47.1	48.3	54.6
54	41.0	43.7	44.8	45.7	47.5	48.9	50.2	56.7
56	42.5	45.3	46.4	47.4	49.2	50.7	52.0	58.8
58	44.0	46.9	48.1	49.1	51.0	52.5	53.9	60.9
60	45.5	48.5	49.7	50.8	52.7	54.3	55.7	63.0
62	47.0	50.1	51.4	52.5	54.5	56.1	57.6	65.1
64	48.5	51.7	53.0	54.2	56.2	57.9	59.4	67.2
66	50.0	53.3	54.6	55.9	57.9	59.7	61.3	69.2
68	51.5	54.9	56.3	57.5	59.7	61.5	63.1	71.3
70	53.0	56.5	57.9	59.2	61.4	63.3	65.0	73.4
72	54.5	58.1	59.6	60.9	63.2	65.1	66.8	75.5
74	56.1	59.7	61.2	62.6	64.9	66.9	68.6	77.6
76	57.6	61.3	62.9	64.3	66.7	68.7	70.5	79.7
78	59.1	62.9	64.5	66.0	68.4	70.5	72.3	81.8
80	60.6	64.6	66.2	67.7	70.2	72.3	74.2	83.9
82	62.1	66.2	67.8	69.3	71.9	74.1	76.0	86.0
84	63.6	67.8	69.5	71.0	73.7	75.9	77.9	88.1
86	65.1	69.4	71.1	72.7	75.4	77.7	79.7	90.2
88	66.6	71.0	72.3	74.4	77.2	79.5	81.6	92.2
90	68.1	72.6	74.4	76.1	78.9	81.3	83.4	94.3

EQUATION: D = (E6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.176 ; E6 = 0.241 ; B7 = 1.045 ; B8 = 0.174

DATA SOURCE: 298 TREES FROM QUE., ONT., ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.2	4.5	4.6	4.7	4.9	5.0	5.1	5.8
10	7.9	8.4	8.6	8.8	9.2	9.4	9.7	11.0
15	11.5	12.3	12.7	12.9	13.5	13.9	14.3	16.2
20	15.2	16.2	16.7	17.1	17.7	18.3	18.8	21.4
22	16.7	17.8	18.3	18.7	19.5	20.1	20.6	23.5
24	18.1	19.4	19.9	20.4	21.2	21.9	22.5	25.5
26	19.6	20.9	21.5	22.0	22.9	23.6	24.3	27.6
28	21.0	22.5	23.1	23.7	24.6	25.4	26.1	29.7
30	22.5	24.1	24.7	25.3	26.3	27.2	27.9	31.8
32	24.0	25.6	26.3	27.0	28.0	29.0	29.7	33.9
34	25.4	27.2	28.0	28.6	29.8	30.7	31.6	35.9
36	26.9	28.8	29.6	30.3	31.5	32.5	33.4	38.0
38	28.3	30.3	31.2	31.9	33.2	34.3	35.2	40.1
40	29.8	31.9	32.8	33.6	34.9	36.0	37.0	42.2
42	31.3	33.5	34.4	35.2	36.6	37.8	38.9	44.3
44	32.7	35.0	36.0	36.9	38.3	39.6	40.7	46.3
46	34.2	36.6	37.6	38.5	40.1	41.4	42.5	48.4
48	35.6	38.2	39.2	40.2	41.8	43.1	44.3	50.5
50	37.1	39.7	40.8	41.8	43.5	44.9	46.2	52.6
52	38.6	41.3	42.4	43.5	45.2	46.7	48.0	54.7
54	40.0	42.9	44.1	45.1	46.9	48.5	49.8	56.7
56	41.5	44.4	45.7	46.8	48.6	50.2	51.6	58.8
58	42.9	46.0	47.3	48.4	50.4	52.0	53.4	60.9
60	44.4	47.6	48.9	50.0	52.1	53.8	55.3	63.0
62	45.9	49.1	50.5	51.7	53.8	55.6	57.1	65.1
64	47.3	50.7	52.1	53.3	55.5	57.3	58.9	67.2
66	48.8	52.3	53.7	55.0	57.2	59.1	60.7	69.2
68	50.2	53.8	55.3	56.6	58.9	60.9	62.6	71.3
70	51.7	55.4	56.9	58.3	60.7	62.7	64.4	73.4
72	53.2	57.0	58.5	59.9	62.4	64.4	66.2	75.5
74	54.6	58.5	60.2	61.6	64.1	66.2	68.0	77.6
76	56.1	60.1	61.8	63.2	65.8	68.0	69.9	79.6
78	57.6	61.7	63.4	64.9	67.5	69.7	71.7	81.7
80	59.0	63.2	65.0	66.5	69.2	71.5	73.5	83.8
82	60.5	64.8	66.6	68.2	71.0	73.3	75.3	85.9
84	61.9	66.4	68.2	69.8	72.7	75.1	77.1	88.0
86	63.4	67.9	69.8	71.5	74.4	76.8	79.0	90.0
88	64.9	69.5	71.4	73.1	76.1	78.6	80.8	92.1
90	66.3	71.1	73.0	74.8	77.8	80.4	82.6	94.2

EQUATION: D = (E6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.181 ; E6 = 0.577 ; B7 = 1.040 ; B8 = 0.185

DATA SOURCE: 302 TREES FROM QUE., ONT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

HARDWOODS

DSIB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.7	4.9	5.0	5.1	5.2	5.3	5.4	5.9
10	8.8	9.2	9.3	9.5	9.7	9.9	10.1	11.1
15	12.8	13.4	13.6	13.9	14.2	14.5	14.8	16.2
20	16.9	17.6	18.0	18.2	18.7	19.2	19.5	21.4
22	18.5	19.3	19.7	20.0	20.5	21.0	21.4	23.5
24	20.1	21.0	21.4	21.8	22.3	22.9	23.3	25.6
26	21.7	22.7	23.1	23.5	24.2	24.7	25.2	27.7
28	23.3	24.4	24.9	25.3	26.0	26.5	27.1	29.7
30	24.9	26.1	26.6	27.0	27.8	28.4	28.9	31.8
32	26.5	27.8	28.3	28.8	29.6	30.2	30.8	33.9
34	28.2	29.5	30.0	30.5	31.4	32.1	32.7	35.9
36	29.8	31.2	31.8	32.3	33.2	33.9	34.6	38.0
38	31.4	32.9	33.5	34.0	35.0	35.8	36.5	40.1
40	33.0	34.6	35.2	35.8	36.8	37.6	38.4	42.2
42	34.6	36.3	36.9	37.5	38.6	39.5	40.2	44.2
44	36.2	38.0	38.7	39.3	40.4	41.3	42.1	46.3
46	37.8	39.6	40.4	41.0	42.2	43.2	44.0	48.4
48	39.5	41.3	42.1	42.8	44.0	45.0	45.9	50.5
50	41.1	43.0	43.8	44.6	45.8	46.9	47.8	52.5
52	42.7	44.7	45.6	46.3	47.6	48.7	49.7	54.6
54	44.3	46.4	47.3	48.1	49.4	50.5	51.5	56.7
56	45.9	48.1	49.0	49.8	51.2	52.4	53.4	58.7
58	47.5	49.8	50.7	51.6	53.0	54.2	55.3	60.8
60	49.2	51.5	52.5	53.3	54.8	56.1	57.2	62.9
62	50.8	53.2	54.2	55.1	56.6	57.9	59.1	65.0
64	52.4	54.9	55.9	56.8	58.4	59.8	61.0	67.0
66	54.0	56.6	57.6	58.6	60.2	61.6	62.8	69.1
68	55.6	58.3	59.4	60.3	62.0	63.5	64.7	71.2
70	57.2	60.0	61.1	62.1	63.8	65.3	66.6	73.3
72	58.8	61.7	62.8	63.9	65.6	67.2	68.5	75.3
74	60.5	63.4	64.5	65.6	67.5	69.0	70.4	77.4
76	62.1	65.0	66.3	67.4	69.3	70.9	72.2	79.5
78	63.7	66.7	68.0	69.1	71.1	72.7	74.1	81.6
80	65.3	68.4	69.7	70.9	72.9	74.6	76.0	83.6
82	66.9	70.1	71.4	72.6	74.7	76.4	77.9	85.7
84	68.5	71.8	73.2	74.4	76.5	78.2	79.8	87.8
86	70.1	73.5	74.9	76.1	78.3	80.1	81.7	89.8
88	71.8	75.2	76.6	77.9	80.1	81.9	83.5	91.9
90	73.4	76.9	78.3	79.6	81.9	83.8	85.4	94.0

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
WHERE: D = DOHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
B2 = 0.145 ; B6 = 0.695 ; B7 = 1.036 ; B8 = 0.137

DATA SOURCE: 1682 TREES FROM QUE., ONT., MAN., SASK., ALTA.

APPENDIX VIII. Useful Conversion Factors[1]

Metric (SI and derived) units and their Canadian yard/pound equivalents

SI Units		Yard/Pound Equivalents
	Length	
1 cm (centimetre)	=	0.393 701 inch
1 km (kilometre)	=	0.621 371 mile
1 m (metre)	=	0.049 709 7 chain (of 22 yd)
1 m (metre)	=	3.280 84 feet
1 m (metre)	=	1.093 61 yards
	Area	
1 cm^2 (square centimetre)	=	0.155 000 square inch
1 ha (hectare)	=	2.471 05 acres
1 km^2 (square kilometre)	=	0.386 102 square mile
m^2 (square metre)	=	0.247 105 mil-acre
m^2 (square metre)	=	10.7639 square feet
m^2 (square metre)	=	1.195 99 square yards
	Volume or Capacity	
1 L (litre)	=	0.219 969 gallon
1 m^3 (cubic metre)	=	35.3147 cubic feet
1 m^3 (cubic metre)	=	1.307 95 cubic yards
1 m^3 (cubic metre)	=	0.353 147 cunit (of 100 ft^3 of solid wood)
1 m^3 (stacked), (stacked cubic metre)	=	0.275 896 cord (of 128 stacked ft^3)
	Mass or Weight	
1 g (gram)	=	0.035 274 0 ounce (avoirdupois)
1 kg (kilogram)	=	2.204 62 pounds (avoirdupois)
1 t (tonne)	=	1.102 31 tons (of 2,000 lb)
	Ratios	
1 kg/m^3 (kilogram per cubic metre)	=	0.062 428 0 pound per cubic foot
1 km/L (kilometre per litre)	=	2.824 81 miles per gallon
1 m^2/ha (square metre per hectare)	=	4.356 00 square feet per acre
1 m^3/ha (cubic metre per hectare)	=	14.2913 cubic feet per acre
1 m^3(stacked)/ha, (stacked cubic metre per hectare)	=	0.111 651 cord per acre
1 t/ha (tonne per hectare)	=	0.446 090 ton (of 2,000 lb) per acre

[1]Bowen, M.G. 1974. Selected metric (SI) units and conversion factors for Canadian forestry. For. Manage. Inst., Can. For. Serv., Dep. Environ. Ottawa, Ont.